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A project submitted in partial fulfilment of the requirements for the degree of a

**DOCTORATE IN PROFESSIONAL STUDIES (DProf):
SUSTAINABLE DEVELOPMENT**

**National Centre for Work Based Learning Partnerships
Middlesex University**

**DEVELOPING THE ENVIRONMENT AGENCY'S
POLICY POSITION ON
ADDRESSING ENVIRONMENTAL INEQUALITIES**

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This document reports on a work-based project undertaken for a doctorate in professional studies (DProf). To fulfil the requirements of this award, this project report provides a reflective and critical analysis of the conception, development and implementation of this project within the organisational context of the Environment Agency, as well as the wider social and political influences at play. The reader is asked to respect the nature and content of this document, which is intentionally candid in presenting insights into the personal and organisational choices made throughout the project. The report is intended to contribute to further reflective practice.

Acknowledgements

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Abbreviations

AGM	Annual General Meeting
AEG	Air Environment Group
AQM	Air Quality Management
BAT	Best Available Technology
BEN	Black Environment Network
BME	Black and Minority Ethnic
BTCV	British Trust for Conservation Volunteers
CASE	Centre for Analysis of Social Exclusion
CDF	Community Development Foundation
CFMP	Catchment Flood Management Plan
CI	Concentration Index
CO ₂	Carbon monoxide
CSP	Community Strategy Partnership
Defra	Department of Environment, Food & Rural Affairs
DETR	Department for the Environment, Transport and the Regions
DfT	Department for Transport
DoH	Department of Health
DProf	Doctorate in Professional Studies
DTI	Department for Trade and Industry
EA	Environment Agency
EN	English Nature
EPA	Environmental Protection Agency
E-Pol	Environmental Policy (Unit)
ESPRC	Engineering Physical & Science Research Council
EU	European Union
FoE	Friends of the Earth
FRM	Flood Risk Management
HIA	Health Impact Assessment
HMT	Her Majesty's Treasury
IFSR	Institute for Environment and Sustainability Research
IFM	Indicative Floodplain Maps
IMD	Index of Multiple Deprivation
IPA	Integrated Policy Appraisal
IPC	Integrated Pollution Control
IPPC	Integrated Pollution Prevention & Control
Ippr	Institute of Public Policy Research
JU	Joining Up (project)
LSE	London School of Economics
LSP	Local Strategic Partnership
MProf	Masters in Professional Studies
NADNAC	National Assessment of Defence Needs and Costs
NAQS	National Air Quality Strategy
NCWBLP	National Centre for Work Based Learning Partnerships
NETCEN	National Environmental Technology Centre
NGO	Non-Governmental Organisation
NO ₂	Nitrogen dioxide
NRF	Neighbourhood Renewal Fund
NRU	Neighbourhood Renewal Unit

NSCA	National Society for Clean Air
NSNR	National Strategy for Neighbourhood Renewal
ODPM	Office of the Deputy Prime Minister
OPRA	Operator & Pollution Risk Appraisal
JUPDG	Joining Up Project Development Group
PAT	Priority Action Team
PCB	Polychlorinated Biphenyls
PDP	Policy Development & Promotion (Team)
PIR	Pollution Industries Regulation
PM ₁₀	Particulate matter (<10 µm in diameter)
PSA	Public Service Agreement
PSG	Policy Steering Group
RDA	Regional Development Agency
RIA	Regulatory Impact Assessment
RSU	Regional Strategic Unit
SDC	Sustainable Development Commission
SDRN	Sustainable Development Research Network
SEA	Strategic Environmental Assessment
SEPA	Scottish Environmental Protection Agency
SEU	Social Exclusion Unit
SFVI	Social Flood & Vulnerability Index
SNIFFER	Scottish and Northern Ireland Forum for Environmental Research
SPD	Spatial Planning Distances
SPT	Social Policy Team
SO ₂	Sulphur dioxide
SSSI	Site of Special Scientific Interest
WAG	Welsh Assembly Government
WFD	Water Framework Directive

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EXECUTIVE SUMMARY

Background and drivers of the project

In the UK there is growing interest in the relationship between environmental quality and social equity. Recent research has shown that the most socially and economically deprived people live in the worst environments. This presents difficult challenges to government and its agencies in delivering sustainable development, but also an opportunity to better integrate social and environmental policy and deliver a better environment and quality of life for everyone. This project arose out of the Environment Agency's interest in understanding these issues, and its social responsibilities in improving and protecting the environment. This report provides a reflective and critical analysis of a work-based project between September 2002 and September 2004 to develop the Environment Agency's policy on addressing environmental inequalities.

Research objectives

The overall aim of this project was to strengthen the Environment Agency's contribution to sustainable development by:

- developing the Environment Agency's understanding of the relationships between environmental quality and social deprivation;
- helping to clarify the Environment Agency's role, and ensure its policies reflect the need to address environmental inequalities; and
- ensuring that others' strategies to tackle multiple disadvantage and promote sustainable development reflect the need to address environmental inequalities.

Methodology and project activities

An action research approach provided the overall framework for the project, in which cycles of action and reflection were used to develop evidence-based policy and wider organisational change. The project utilised a variety of research techniques, including quantitative statistical analysis, documentary research and collaborative inquiry with critical stakeholders. The data was triangulated to understand the relationships between environmental quality and social deprivation, the Environment Agency's role in addressing environmental inequalities, and wider

policy options. A wide range of the Environment Agency's staff and its external stakeholders were involved in developing the research, making sense of the evidence, and developing and negotiating the policy solutions.

Results

The project established that:

- While the quality of the environment is generally improving, the most socially and economically deprived communities tend to live in the worst environments. For example, those living in the most deprived wards in England experience the worst air quality, are most likely to live next to industrial sites and are most likely to live in tidal floodplains. In Wales, the picture is very different. Air pollution is generally better, the location of industrial sites show some bias towards affluent areas, and the link between flooding and deprivation is less clear.
- The Environment Agency's role is to contribute to a better quality of life for everyone, by improving and protecting the environment and wherever their background and wherever they live. To inform its approach, the Environment Agency carries out research on environmental inequalities and works with others to develop the most effective ways of tackling them. It takes account of the social and economic impacts of its work whenever possible and includes the interests of disadvantaged communities in its work. The Environment Agency advises on the environmental impacts of planning decisions, and advises government on environmental inequality.
- The Environment Agency is committed to doing what it can to address environmental inequalities and will ensure that it does not contribute to inequalities in the future. It will undertake further research on environmental inequalities and scrutinise its approach to modern regulation and flood risk management. It will carry out Strategic Environmental Assessment to assess the impact of its plans and programmes on people, and continue to provide

information, and support processes that help people to make better decisions about their environment.

- Work is also needed by government, business and society to address environmental inequalities at a national, regional and local level. The Environment Agency is calling for:
 - a better understanding of environmental inequalities and the most effective ways of addressing them;
 - government policy to promote a reduction in environmental inequalities;
 - government to address environmental inequalities through tackling disadvantage;
 - regional and local planning authorities to prevent further environmental inequalities;
 - communities supported and involved in decisions that affect their local environment.

Project impact

The Environment Agency's understanding of the relationships between environmental quality and social deprivation has developed considerably as a result of this project. New knowledge about environmental inequalities has led to increasing dialogue at different levels within – and outside the organisation about the Environment Agency's role in improving and protecting the environment in deprived areas. The project has laid the foundations for future changes in Environment Agency policy and practice.

The project has provided leadership in championing these issues across government and has been instrumental in informing the commitments within the UK Sustainable Development Strategy. Through collaborative work with the Office of the Deputy Prime Minister, the Environment Agency has seen a shift in the government's thinking about the environmental dimensions of disadvantage and wider commitment to integrate environment and social justice across government policy.

Recommendations

The project developed specific recommendations for future research, policy and practice to address environmental inequalities. This report also makes

recommendations for the ways in which the Environment Agency should take these forward by:

- (i) continuing to shape and champion research and policy to address environmental inequalities, but also demonstrating its commitment to this issue (as set out in its *Environmental Vision* and position statement) by integrating environmental equality into its policies and processes, and through its corporate targets.
- (ii) undertaking practical pilots with local, regional and national partners to demonstrate the value of addressing environmental inequalities;
- (iii) placing greater emphasis on joining up the practical experience of its staff on the ground with the needs and views of the communities it works with, in the development of policy;
- (iv) supporting the use of social science and encouraging the inclusion of more diverse voices, particularly those that are most excluded, in the development of evidence-based policy;
- (v) continuing to promote the use of participatory approaches to support the development of science and policy;
- (vi) supporting greater opportunities for reflection, evaluation and learning from the experience of practice and policy – for example through work-based doctorates, learning sets, reflection, mentoring, and secondments.

1. BACKGROUND AND DRIVERS OF THE PROJECT

This report summarises and reflects on a research project aimed at developing a policy position for the Environment Agency on addressing environmental inequalities. The Environment Agency sponsored this research as one of a series of projects to be undertaken as a work-based learning doctorate in professional studies ('DProf'), with the explicit aim of improving the Environment Agency's contribution to sustainable development.

This first section will examine the background and main drivers for developing this project for the Environment Agency. In summary, the key drivers for this project were:

- the growing evidence that the most socially and economically disadvantaged people live in the worst environments;
- the lack of recognition of the environmental aspects of deprivation in the UK; and
- the Environment Agency's emerging understanding of its social responsibilities in delivering a better quality of life through improving and protecting the environment.

But first of all, this report will introduce the organisation in which this project was conducted.

1.1 The Environment Agency

The Environment Agency is a non-departmental public body, which is sponsored by the Department for the Environment, Food and Rural Affairs ('Defra') and is responsible for improving and protecting the environment in England and Wales. The Environment Agency was set up under the Environment Act 1995 to take an integrated approach to environmental protection and brought together the environmental functions of its predecessors: Her Majesty's Inspectorate of Pollution, the National Rivers Authority, and some local government responsibilities for regulating waste. The Environment Agency has major responsibilities for controlling industrial pollution, wastes management, regulation of the water

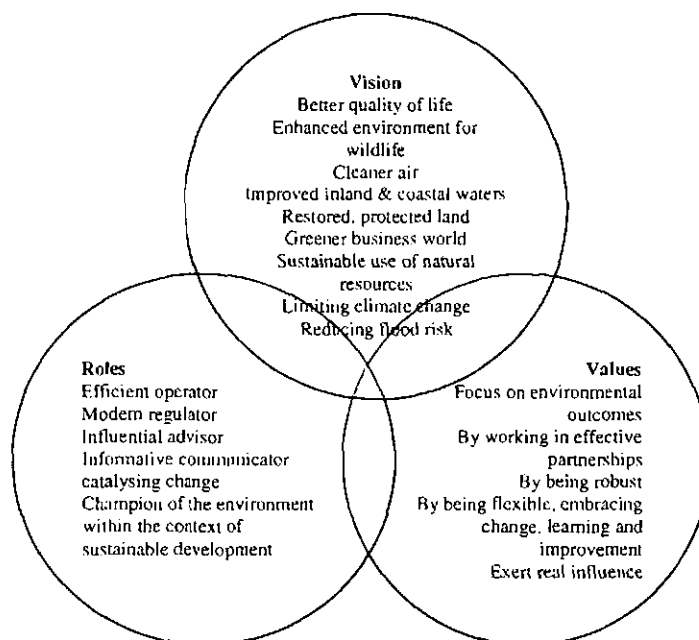
environment, flood risk management, recreation, navigation and conservation. It carries out these functions to achieve the organisation's core corporate objectives and themes of its *Environmental Vision* (Environment Agency, 2001a), see figure 1.1.

The Environment Agency delivers its corporate objectives through its operations on the ground; by working at a regional level with a range of stakeholders; and by advising government on the environmental aspects of policy. The organisation's roles and values were defined in 2001 through an extensive process of organisational change called *Making it Happen*, which was driven by the new Chief Executive, Baroness Barbara Young of Old Scone (Environment Agency, 2003a).

This process marked a significant change in the organisation's approach to environmental protection and signalled an increased focus and emphasis on:

- delivering and measuring the Environment Agency's progress against environmental outcomes;
- strategic policy development and advocacy on a wider range of issues of key importance to the Environment Agency, and where it has less capacity to deliver change through its regulatory duties, for example in relation to climate change, transport and urban regeneration;
- promotion of evidence-based policy, and the development of a five-year Science Strategy;
- improving the Environment Agency's approach to modern regulation and operational performance;
- working in partnership with others, in recognition that the Environment Agency cannot improve and protect the environment through its actions alone;
- involving stakeholders in the development of policy and identifying local priorities, for example through the development of 'Local Contribution' documents. These describe the organisation's local targets and the outcomes it will deliver through its twenty six Area offices.

Figure 1.1 The Environment Agency's objectives, roles and values



Source: Environment Agency (2003a). Making it Happen. Corporate Strategy 2002-2007. Bristol, Environment Agency.

While its principal aim is to improve and protect the environment, the Environment Agency is required to do so in the context of sustainable development (Defra, 2002), according to the principles and objectives set out in the UK Sustainable Development Strategy (DETR, 1999).

The Environment Agency should contribute to sustainable development through its two main roles, which are:

- to protect and enhance the environment in a way which takes account of economic and social considerations; and
- to be an independent advisor on environmental matters affecting policy making, both within government and more widely.

In 2000, the Environment Agency set out its *Environmental Vision* and contribution to sustainable development, stating that:

'The Environment Agency is committed to meeting the [environmental, social and economic] challenges and to pursuing sustainable development in the interests of society ... Our vision for the environment and for a sustainable future is: a healthy, rich and diverse environment in England and Wales, for present and future generations' (Environment Agency, 2001a).

The *Environmental Vision* recognised that in order to meet these challenges, the Environment Agency would need to adopt imaginative new approaches: changing attitudes and behaviour; growing collaborative partnerships; exploiting technological innovation; and lastly, by developing its social awareness, and understanding of its social responsibilities. Over the last five years, the Environment Agency has been working to understand its social responsibilities – work that led to its growing interest in environmental equity, and to which I will return in section 1.5.

1.2 Evidence of environmental inequalities

When this project began in September 2002, a growing number of studies suggested that there is an unequal distribution of environmental pollution and access to environmental goods, and that it is the poorest people in the United Kingdom who live in the worst environments, see figure 1.2.

Figure 1.2: Early evidence of environmental inequalities in the UK

- Families living on incomes of less than £5,000 are twice as likely to live next to a polluting factory than families with incomes of £60,000 or more (Bullock et al, 1999)
- Respiratory problems in London have been found to concentrate in the poorest areas and correlate with high traffic levels (Stevenson et al, 1998)
- Child pedestrians from poorer communities are five times more likely to be killed by vehicles than children from the most affluent areas (ESRC, 2001)
- Fuel poverty is estimated to affect 4.5 million households in the UK (DETR, 2001), and is linked to higher levels of winter mortality - an average of over 30,000 extra winter deaths per year as a result (ONS, 2000)
- Good parks in prosperous areas are getting better, while poor parks in poor deprived areas are getting much worse (DTLR, 2001)

Source: Adapted from Eames, M. and Adebawale, M. (eds.) (2002). Sustainable Development and Social Inclusion: Towards an Integrated Approach to Research. York: Policy Studies Institute.

Unequal distribution of environmental 'bads'

Many of these studies, such as the analyses undertaken by Friends of the Earth (FoE) have shown that many sources of environmental pollution can be found in deprived areas. For instance, using the government's Index of Multiple Deprivation (IMD) and the Environment Agency's Pollution Inventory data (Environment Agency, 2001c), FoE found that of the 11,400 tonnes of carcinogenic substances emitted to the air from large factories in England in 1999, eighty two per cent were emitted from factories located in the most deprived twenty per cent of local authority wards (Bullock et al, 1999; FoE, 2001). Other studies have mirrored the extensive environmental justice research in the United States and examined the proximity of particular social groups to pollution. One of the first UK studies to do so found a significant bias towards hazardous sites being located in wards with a higher proportion of ethnic minority populations (Walker et al, 2000).

In the US, Faber and Kreig found that 'communities of colour are nineteen times more likely to live near to contaminated areas than wealthier white people' (Faber and Krieg, 2001), and helped bring national attention to the siting of landfills and polluting industries in predominantly black and minority communities. This raised concerns that the proximity of pollution has a disproportionate effect on the health of deprived and other vulnerable communities who already experience ill health. However, evidence on the cause and effect of waste management sites on human health remains contested. While some communities, campaign groups and researchers point to incidences and experiences of poor health around specific industrial sites (Dolk et al, 1998), much of the scientific evidence which informs current government policy has found inconclusive evidence of the health risks of landfill sites and incinerators (CoT, 2001/04; Enviro Consulting, University of Birmingham, Defra, 2004).

Transport in urban areas effects the environment and human health of the poorest and most vulnerable groups, such as children most (Stevenson et al, 1998; Mitchell and Dorling, 2003). As the government's inquiry into 'Inequalities in Health' noted, 'the burden of air pollution tends to fall on people experiencing disadvantage, who do not enjoy the benefits of the private motorised transport which causes the

pollution' (Acheson, 1998). This suggests that there is injustice in the production of the pollution, as well as that its environmental impacts are unequally distributed.

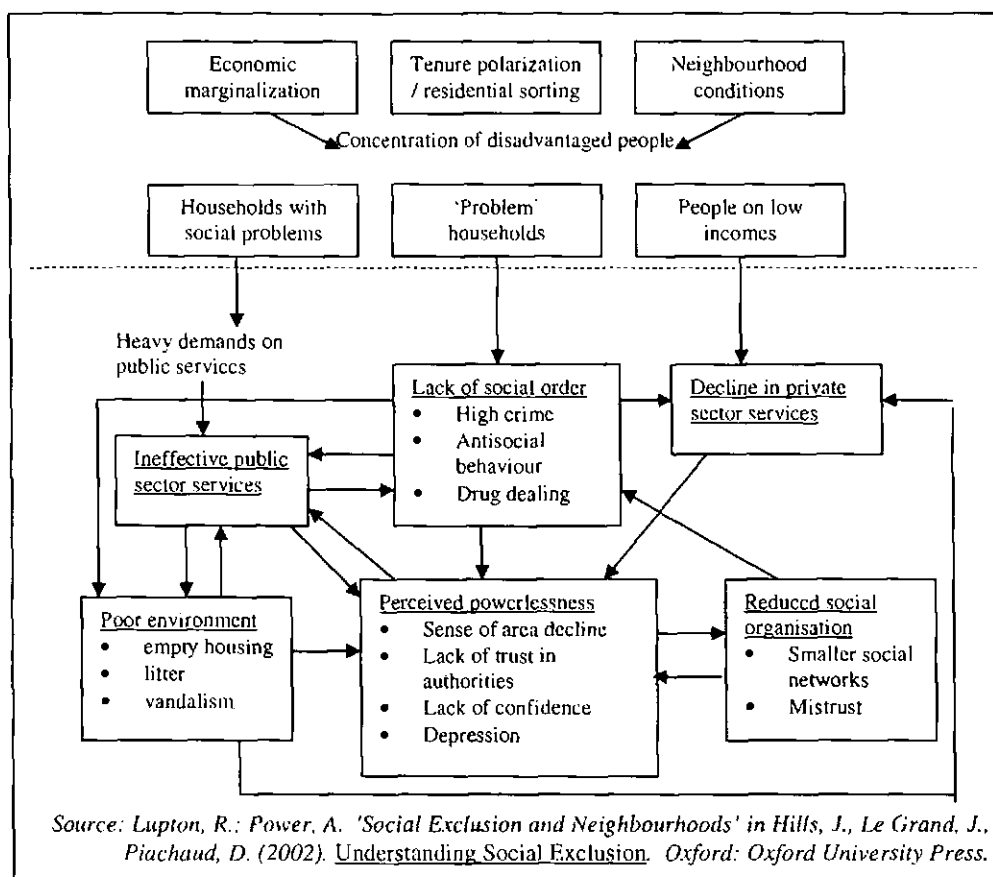
There is also increasing concern about wider intangible social and psychological health effects of environmental hazards, such as flooding (Tapsell et al, 2002) on people who are already deprived and more vulnerable groups because of social and economic factors. Overall, little is known about the causal relationships between pollution, deprivation, and the effects on people's health and a need for further research into the links between pollution and deprivation (Pless-Mullooli and Phillimore, 2001).

Unequal distribution of environmental 'goods'

Other bodies of research have examined the unequal distribution of access to environmental goods and services that affect people's immediate and indoor environment, such as good quality housing, energy and warmth. For example, the most socially and economically disadvantaged groups, such as lone parents, the unemployed, the elderly, children and ethnic minorities have been found to live in poor and damp housing, and suffer from poor health (Shelter, 1998). Such low-income groups are also least likely to be able to afford rents, adequate heating systems, insulation or energy to heat their homes. According to the government, over 4.3 million households in England are 'fuel poor', spending ten per cent or more of their income on keeping warm (DETR, 2001).

Again it is thought that poor access to environmental goods and degraded local environments can compound the effects of ill health as well as other aspects of multiple disadvantage and can limit the opportunities of individuals and communities to improve their lives (Lupton and Power, 2002). Figure 1.3 shows the role that a poor quality environment can play in compounding the effects of multiple disadvantage. In the Green Alliance pamphlet on environmental justice, Ken Worpole wrote that 'poor people, and disadvantaged communities, often get penalised twice. Not only do they live with fewer economic resources, they often - indeed almost always - live in environments which exact an additional toll on their well-being, through being less healthy, less accessible, and literally more expensive places in which to survive' (Worpole 2000).

Figure 1.3: Inter-linked and compounding effects of area disadvantage



Unequal public service delivery and access to environmental justice

This model also highlights the role of authorities and public services in contributing to- and addressing these inequalities, and how particular policy measures can have adverse distributional effects. In the United States, much of the environmental justice research and campaigns by community groups and organisations have pointed to evidence of the uneven distribution of environmental risks amongst racial groups and claims of environmental racism by public authorities. For example, some studies have suggested that the level of environmental and public health protection afforded to black and ethnic minorities by the US Environmental Protection Agency (EPA) is substantially less than that generated for whites and more wealthy people (Bullard, 1990; Lavelle and Coyle, 1992). However, class actions brought against civil authorities on the grounds of unjust planning decisions have been largely unsuccessful, due in most part to the poor empirical foundations of inequitable

relationships between racial and income groups, environmental problems and their associated effects on people's health (Bowen, 2002).

To address these concerns in the US, environmental justice was adopted as one of the EPA's seven guiding principles of the 1993 Strategic Plan (USEPA, 2005). This led to the Executive Order, signed by President Clinton in 1994, which requires that:

'To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Marian islands.' (President, 1994).

The EPA's Environmental Justice Strategy was designed to ensure the integration of environmental justice into all the EPA's programmes, policies and activities. The Strategy focuses on five main priorities: 1) public participation and accountability, partnerships, outreach and communication with stakeholders; 2) health and environmental research; 3) data collection, analysis and stakeholder access to public information; 4) American Indian and indigenous environmental protection; and 5) enforcement, compliance assurance, and regulatory reviews (US EPA, 1995).

In contrast, the environmental justice debate in the UK has developed largely in relation to joining up environmental protection with efforts to regenerate deprived communities, rather than through accusations of intentional discrimination by public authorities. But there is some concern that the level of environmental protection given to deprived communities is less than that afforded to wealthier people – and those who are able to represent themselves more effectively in formal planning and legal processes. For example, studies have shown that people in deprived areas and ethnic minorities are less able to afford- or have access to procedural justice such as appropriate legal advice and action on environmental matters (Church et al. 1998; Adebowale, 2004).

Other studies commissioned by Defra to support the UK ratification of the Aarhus Convention have drawn similar conclusions¹. The 1998 UN Economic Commission for Europe's Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, signed in Aarhus in 1998 provides for:

- the right of everyone to receive environmental information that is held by public authorities ("access to environmental information");
- the right to participate from an early stage in environmental decision-making. ("public participation in environmental decision-making");
- the right to challenge, in a court of law, public decisions that have been made without respecting the two afore mentioned rights or environmental law in general ("access to justice"). (United Nations ECE/CEP/43)

The Aarhus Convention supports earlier principles agreed on human rights to a healthy environment established by the 1972 Declaration from the UN Conference on the Human Environment, which stated that:

'Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations' (UN, 1972).

More recently, in April 2001, human and environmental rights were brought together when the UN Commission on Human Rights agreed 'everyone has the right to live in a world free from toxic pollution and environmental degradation' (UN, 2001).

Exclusion of disadvantaged groups from environmental decision-making

These moves to protect the 'procedural' rights for environmental justice stem from a growing concern that deprived and ethnic minority communities are excluded from – or less well represented - in environmental decision-making. Just as 'socially-

excluded people or areas 'suffer from a combination of linked problems such as unemployment, poor skills, low incomes, poor housing, high crime, bad health and family breakdown' (SEU, 2001a), so they can be excluded from the benefits from a clean and safe environment.

Lack of representation of the black and minority ethnic and deprived groups in environmental decision making has served to fuel the widely held belief that poorer communities are not interested in the environment (Lucas, Ross and Fuller, 2003). This is a myth which has been firmly dispelled by studies such as that by Burningham and Thrush (2001), who concluded that while many disadvantaged communities in the UK may not be interested in the destruction of Amazonian rainforests, they have grave concerns about their own local environments.

Indeed, public opinion surveys have shown that people living in deprived areas or with lower incomes are just as concerned for the environment as more affluent residents, see figure 1.4. For instance, a study by the Social Exclusion Unit found that people living in the 44 most deprived areas in England listed pollution, poor public transport and the appearance of their estate as major concerns about where they lived (SEU, 1998).

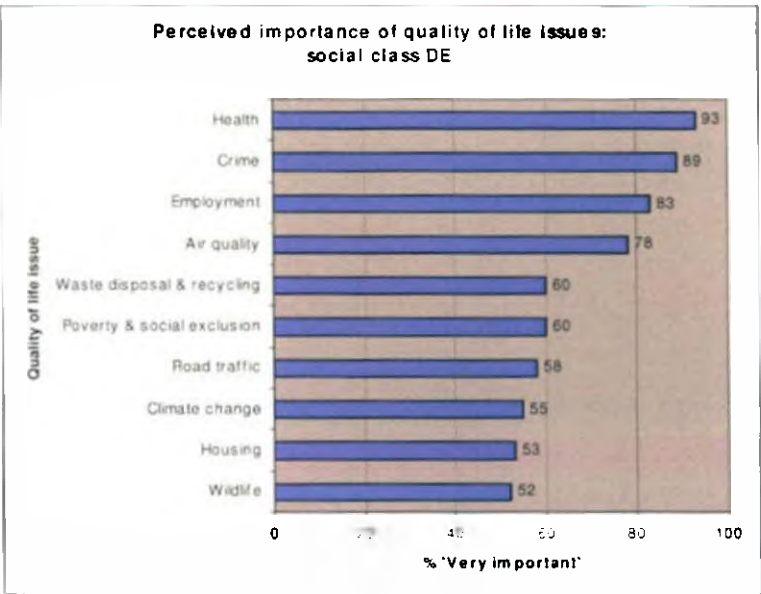
Figure 1.4: Concern for the environment by different social groups

<i>Q How concerned are you about the environment in general?</i>				
Base: 816 and 728 residents in social class AB and DE; 3,547 White and 186 Black, Minority and Ethnic (BME) residents (% responses)				
	AB	CD	White	BME
Very concerned	35	34	36	38
Fairly concerned	59	58	56	52
Not very concerned	6	7	7	7
Not at all concerned	1	1	1	2
Source: DEFRA (2001). <i>Survey of Public Attitudes to Quality of Life</i> . London: The Stationery Office for the Department for the Environment, Food and Rural Affairs.				

¹ For reports on environmental justice commissioned by the Department for the Environment, Food and Rural Affairs see: <http://www.defra.gov.uk/environment/enforcement/justice.htm>

While residents in the social classes DE consider issues like health, crime and employment of more immediate concern to their quality of life, wider environmental issues such as air quality, waste and climate change are also notable concerns, see Figure 1.5.

Figure 1.5: Perceived importance of quality of life issues for social class DE



Source: DEFRA (2001). *Survey of Public Attitudes to Quality of Life*. London: The Stationery Office for the Department for the Environment, Food and Rural Affairs.

728 social class DE residents questioned by asking “A number of quality of life issues are being measured. I’d like you to place each one of them to show how important you think it is to quality of life, both now and in years to come?”

These concerns are also evident through the actions of groups such as ‘Communities Against Toxics’ and the ALARM campaign to stop road building, airport expansions, the location of polluting industries and new waste incinerators near their communities. A growing number of non-governmental organisations (NGOs) in the UK, such as Capacity Global and members of the ‘Environmental Justice Network’ are working to tackle environmental injustice at a local level. Organisations including the Black Environment Network (BEN) and the British Trust for Conservation Volunteers (BTCV) encourage participation of black and white ethnic minorities and other disadvantaged groups in the protection of the environment through practical projects. Meanwhile, Friends of the Earth in England and Scotland

are supporting individuals and communities in fighting environmental injustice through a range of projects. For example, FoE funds a community worker and group called IMPACT which campaigns against the pollution of multiple industrial processes in Teeside. Friends of the Earth and others point to four broad areas where changes are needed to policy and practice to achieve environmental justice:

- (i) Rights and responsibilities: ensuring a right to a healthy environment is an overarching aim of policy, which must be supported by placing responsibilities on individuals and organisations to ensure this right is achieved;
- (ii) Assessment: projects and policies need to be assessed for their distributional impacts;
- (iii) Participation and capacity: decision-making should involve those affected, and those groups or individuals enduring environmental injustices need support in order to increase their control over decisions which affect them;
- (iv) Integration: of social and environmental policy aims (ESRC, 2001).

Through campaigns and research, NGOs and academics have highlighted procedural and substantive inequalities and have made connections between this emerging environmental justice agenda and contemporary political narratives in the UK. For instance, environmental equity is now recognised to have integral links with sustainable development (Dobson, 1999), human equality and development (Agyeman and Evans, 2002), social inclusion (Lucas and Ross, 2000; Eames & Adebawale, 2002), the politics of sustainable consumption (Jacobs, 1997), and environmental modernisation (Jacobs, 1999).

There is evidence of that political attention is now being paid to these issues. In recent years successive speeches by UK government ministers have shown increasing recognition that the poorest people in our society experience the worst environments. They have also highlighted the need to prioritise environmental and social justice in government policy (see figure 1.6). Although we were seeing these issues coming to the fore, at the start of this project environmental equity had yet to become a part of government policy, as the next section will demonstrate. Two

important foundations for environmental justice in UK policy were put in place in the current Labour government's first term.

Figure 1.6: Political leadership on environmental justice in the UK

- In his speech to the Fabian Society in February 2000, John Prescott, UK Deputy Prime Minister said that "We should never lose sight of the fact that it is the poor who suffer most from pollution";
- In November 2001, Michael Meacher, Minister for the Environment gave a speech on Environmental Justice in which he stated that more needs to be done to ensure environmental equality, and noted the work of Capacity Global and other NGOs in promoting environmental justice in the UK;
- In a landmark speech on environmental policy in February 2002, First Minister of the Scottish Executive, Jack McConnell, stated that "people who suffer most from a poor environment are those least likely to fight back...I am quite clear that the gaps between the haves and the have-nots is not just an economic issue. For quality of life, closing the gap demands environmental justice too. That is why I said...that environmental and social justice would be the themes driving our policies and priorities" (McConnell, 2002).

1.3 UK policy framework for environmental justice

The UK commitment to sustainable development

The 1999 UK Strategy for Sustainable Development provides the basis for the government's commitment to environmental and social justice. In its definition of sustainable development: '*a better quality of life for everyone, now and for generations to come*' (DETR, 1999), the government highlighted the need to halt global environmental degradation, meet people's needs and address the inequitable distribution of wealth both within and between nations, and between generations. This marked a significant shift away from a focus on wealth creation and towards a social welfare approach. In addition, the Strategy challenged policy makers to achieve these four objectives in parallel, with action to effectively protect the environment alongside combating poverty and social exclusion. It pledged that everyone should share in '*the benefits of increased prosperity and a clean safe environment*' (DETR, 1999), see figure 1.7.

Figure 1.7: UK Sustainable development objectives and principles

<ul style="list-style-type: none">• Social progress that meets the needs of everyone• Effective protection of the environment• Prudent use of natural resources• Maintenance of high and stable levels of economic growth and employment	<ul style="list-style-type: none">• putting people at the centre• taking a long term perspective• tacking account of costs and benefits• creating an open and supportive transparent system• combating poverty and social exclusion• respecting environmental limits• the precautionary principle• using scientific knowledge• transparency, information, participation and access to justice• making the polluter pay
<i>Source: DETR (1999). A Better Quality of Life: A Strategy for Sustainable Development in the UK. London: The Stationery Office for the Department of the Environment, Transport and the Regions.</i>	

Yet there has been mixed progress in translating this commitment to sustainable development and in meeting the four objectives through government policy in a joined up way. The government evaluates progress in delivering sustainable development and improving quality of life at a local level through the government’s fifteen headline indicators (Defra, 2001). Despite substantial efforts in economic development, tackling poverty, improving public health and protecting the environment; inequalities in health and quality of life continue to rise, see figure 1.8. While the overall state of the environment in the UK is improving, there are still areas of poor environmental quality and environmental hazards in urban, and largely deprived areas (Environment Agency, 2002a).

Figure 1.8: Trends in quality of life in the UK

Aspect	Trend 1990-date	
Health	☺	People living longer, but health inequalities in urban areas
Poverty	☹	Progress, but inequalities have risen
Employment & economy	☺	Unemployment declining, GDP increasing
Litter	☹	Spoils quality of urban areas
Wildlife habitats	☹	Development reducing extent of habitats
Air quality	☺	Improving, but some cities exceed air quality objectives
Water quality	☺	Improving but urban river quality still poor
Flood risk	☹	Pressure to develop on floodplains, and increasing risk of climate change
<i>Source: DETR (2000e) Quality of Life Counts. London: HMSO adapted in Environment Agency (2002b) The Urban Environment. Bristol: Environment Agency.</i>		

As the Sustainable Development Commission recommended in its review of the government’s progress, ‘while there has been welcome improvement in some areas

of reducing child poverty and fuel poverty, a greater policy focus needs to be placed on addressing environmental inequalities alongside social and economic problems' (SDC, 2004). Indeed, in a review of the challenges of sustainable development for European environmental policy, the European Commission highlighted the contribution of environmental policies to 'the fight against poverty and exclusion' and how 'tackling a degraded environment can have positive distributional impacts' (CEC, 2003);

Neighbourhood renewal in the most deprived areas

The second foundation for UK policy on environmental justice was a major programme of research initiated by the Social Exclusion Unit in 1997 to understand the pattern of multiple deprivation in England (SEU, 2000). This led to the development of the National Strategy for Neighbourhood Renewal and the creation of the Neighbourhood Renewal Unit to tackle deprivation in England's 88 most deprived communities (SEU, 2001b). The Communities First programme in Wales, developed by the National Assembly for Wales takes a similar approach to regeneration, targeted at the most deprived one hundred communities in Wales (WAG, 2001). The National Strategy for Neighbourhood Renewal (NSNR) aims to 'narrow the gap between the deprived neighbourhoods and the rest of the country to a level whereby within 10 to 20 years, no one should seriously be disadvantaged by where they live' (SEU, 2001b). The Strategy takes an area-based approach to raising the level of the housing, jobs, crime, education and health, by allocating an £800 million Neighbourhood Renewal Fund (NRF) to support regeneration in the 88 most deprived local authority districts.

The National Strategy for Neighbourhood Renewal and the Communities First programme both represented serious attempts to tackle the multiple and interconnected dimensions of disadvantage and inequality. This is a clear priority for the current government who expressed determination that 'public services should address the needs of all groups ... and reflect the full diversity of society' (Cabinet Office, 1999). In particular, the recent modernising local government agenda recognised that many of the problems experienced by traditionally excluded group and individuals, such as those on low incomes, the elderly, ethnic minorities and lone parents are exacerbated by gaps in policy and service delivery (Lucas, 2000).

In his speech in the London Borough of Hackney in 2002, Prime Minister Tony Blair said that:

"Our goal is a Britain in which nobody is left behind; in which people can go as far as they have the talent to go; in which we achieve true equality - equal status and equal opportunity rather than equality of outcome. Poverty is multi-dimensional. It is not only about money. It is also about jobs, access to public services, environment and ambition. It is about education, housing, the local environment, training, jobs, your home and family life, being free from crime and drugs" (Blair, 2002).

1.4 Gaps in the UK policy framework for environmental justice

Despite these sentiments about the multi-dimensional aspects of poverty, many of the government's mechanisms for 'narrowing the gap' and tackling inequalities fail to take account of inequalities in the distribution of environmental impacts and resources, or recognise that improving the environment can benefit people's quality of life.

The National Strategy for Neighbourhood Renewal and Communities First programme failed to make reference to the environment as a source of either constraints or opportunities for regeneration (Warburton, Levett, and Pilling, 2005). As the Environment Agency's own response to the consultation on the NSNR highlights, it is 'strangely silent on environmental issues. It misses not only the environmental dimensions of poverty and social exclusion, but also the key part to be played by environmental issues – and the agencies that deal with these – in developing joined up solutions' (Environment Agency, 2000a).

The Government's Index of Multiple Deprivation (2000) provides few indicators of environmental deprivation. The Index of Multiple Deprivation 2000 showed the distribution of multiple deprivation in England's wards; and is used to identify areas eligible for neighbourhood renewal funds (NRF). Comprised of six indices, the IMD 2000 covered income, employment, health and disability, education skills and training, housing, and geographical access to services, with no indication of how

people are deprived by the quality of their environment or have access to environmental resources. The report on the IMD 2000 notes the importance and widespread support for the inclusion of a physical environment domain in the Index, but cites the lack of small-area national data on, for example land, water and air quality (DETR, 2000a).

Policy appraisal tools, such as the Treasury's 'Green Book' (HM Treasury, 2003) make some attempt to evaluate the distributional impacts of policies and projects on different social groups. Meanwhile Regulatory Impact Assessment takes account of equity and fairness (Cabinet Office, 2003), following the Better Regulation Task Force's report on 'Protecting Vulnerable People' (Better Regulation Task Force, 2002). However none of these require policy makers to consider the impacts of policy and decisions on the distribution of environmental quality on different areas or social groups.

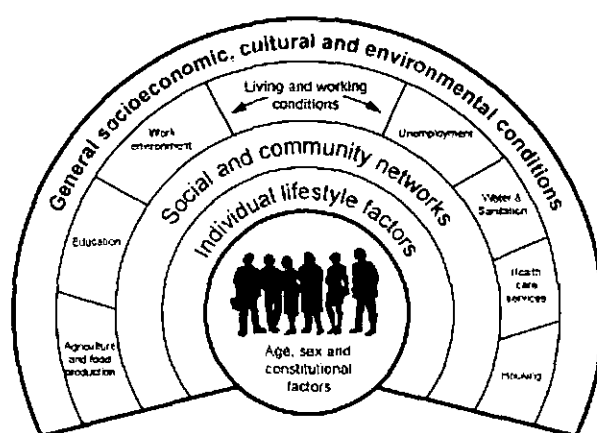
Public Service Agreements (PSA) and Floor Targets, which drive public spending and public service performance in deprived areas, include few environment-related targets. With the exception of the PSA target to reduce the gap in rural productivity and accessibility of services² and improve air quality, Defra had few environmental PSAs which require public services to address inequalities in the quality of the environment in deprived areas. At the same time, other government departments with responsibility for tackling health inequalities (Department of Health), reducing traffic accidents, (DfT), improve housing conditions (ODPM) or improve the economic performance (DTI) in deprived areas, are not linked with the environment.

Community Strategies and Local Strategic Partnerships are the main delivery mechanism for local authorities to promote sustainable development through their 'power of well-being' by 'tackling social exclusion, reducing health inequalities, promoting neighbourhood renewal and improving local environmental quality' (LGA, 2000). Community Strategies and Community Plans are developed by Local Strategic Partnerships (LSPs) in England and Community Strategy Partnerships (CSPs) in Wales. The NRF funds LSPs in the 88 most deprived areas, which bring

together partners from across the public, private, business, community and voluntary sectors and help deliver PSA targets. However, environmental issues tend to remain peripheral in both the national guidance and individual LSPs (Chalmers and Colvin, 2002).

Tackling health inequalities is a key government priority, but needs to take better account of the environmental determinants of health. In 1998, the Acheson Inquiry into Inequalities in Health (Acheson, 1998) examined the model first proposed by Dahlgren and Whitehead (1991) to identify the environmental determinants of health, including housing conditions, fuel poverty and the effects of transport, see figure 1.9. The subsequent Programme for Action (DoH, 2003) recognises the environmental determinants of health inequalities. However, it presents a limited view of the impacts of the environment on people's health (focusing on tobacco smoke and obesity), and gives little consideration to wider environmental factors such as air quality and flooding.

Figure 1.9: Determinants of health



Source: Acheson, D. (1998). *Independent Inquiry into Inequalities in Health*. London: The Stationery Office.

In summary, while there is growing recognition of the multiple dimensions of deprivation, the environment is frequently absent from programmes that aim to tackle deprivation and inequality. The 1999 UK Sustainable Development Strategy

² PSA target: 'Reduce the gap in productivity between the least well performing quartile of rural areas and the English median by 2006, and improve the accessibility of services for rural people'.

provides the foundation and principles for joining up social progress with protection of the environment. Meanwhile, the National Strategy for Neighbourhood Renewal and Communities First programme provides the principle frameworks for tackling multiple deprivation in England and Wales. However, the synergies between environmental and social concerns are often absent from government policy. For example, while current transport policy attempts to meet people's mobility needs, the increase in car use and associated air pollution for road transport impacts on people's health and environment.

1.5 The Environment Agency's response to this agenda

Another key player in this emerging debate was the Environment Agency. Before this project commenced in October 2002, the Environment Agency had already begun to consider how it could contribute to disadvantaged areas and tackle environmental inequalities through a number of initiatives.

AGM debate on 'achieving environmental equality'

Firstly, the Environment Agency provided early leadership on this issue in 2000 by holding a stakeholder dialogue on environmental equality as part of its Annual General Meeting. Speaking at the debate, Sir John Harman, the Environment Agency's Chairman acknowledged that:

"A small number of people tend to pay most of the price for production in terms of pollution. It is true that access to environmental benefits depends substantially on income" (Environment Agency, 2000b).

He went on to say that:

"good regulation is in itself a force for equality. Contaminated land, water and air, the disposal of municipal, commercial and radioactive waste, flooding and climate change all have social and economic impacts, and these are not evenly distributed across communities. The potential for the Agency to tackle environmental inequalities is therefore considerable." (Environment Agency, 2000b).

Following this debate, the Environment Agency identified six action points for 'achieving environmental equality':

- mapping and identifying where there are social and environmental inequalities and sharing this information;
- working with business to ensure that its regulation work improves the environment for everyone;
- providing better information and consultation techniques, to contribute to community plans, local waste strategies, local transport plans and local land use;
- working with key national and regional initiatives which are tackling social exclusion;
- further developing the skills and capacity of the Environment Agency's staff to work with stakeholders;
- understanding how the international dimensions of environmental equality affect the Environment Agency (Environment Agency, 2000b).

The Environment Agency's *Vision* of environmental equality

This commitment was subsequently echoed in the Environment Agency's '*Environmental Vision*', which looked forward to a future in which 'environmental responsibilities [are] taken seriously by all and mechanisms for ensuring environmental equality and justice [are] readily available to all individuals and communities who need them' (Environment Agency, 2001a).

The *Vision* also indicated the Environment Agency's increasing recognition of the social justice aspects of its work and stated that the organisation needed to be: 'more aware of the social issues raised by its work in protecting and improving the environment; for example the needs of people in poverty who often live in the most polluted neighbourhoods. This means becoming more active in decisions on integrating environmental sustainability with social justice and a more dynamic economy' (Environment Agency, 2001a).

Of its forty-six national targets, several specifically relate to the organisation's responsibilities towards improving the environment in degraded and disadvantaged areas:

- 'We [the Environment Agency] will contribute to all Local Strategic Partnerships, focusing effort on the fifty per cent where we can most benefit social and environmental capital, including disadvantaged communities and ethnic minorities';
- 'By 2005, increase participation in fishing (rod licence sales increased by ten per cent over ten years), focusing particularly on disadvantaged groups such as young people, disabled, unemployed and the elderly'.
- 'As a minimum, in areas where an EU standard is exceeded, we will ensure that the activities we regulate do not make a significant contribution to poor air quality. We will also make our contribution to the achievement of the UK air quality objectives';
- 'Achieve a reduction in the proportion of properties within the floodplain exposed to a 'high risk' of flooding; and By 2005, for flood defence systems in urban areas, ensure fifty per cent (by 2008, seventy per cent) are in good condition or better, and no more than five per cent (by 2008, three per cent) are in poor condition or worse';

However, the Environment Agency's social responsibilities are not made explicit in its other corporate targets, with little recognition given to the social, economic or health outcomes of these improvements.

'Joining up' environmental and social policy

Joining up environment and social policy has been a key aspect of the Environment Agency's Sustainable Development Unit. The 'Joining Up' initiative, led by the Social Policy Manager has been instrumental in raising awareness of the social dimensions of the organisation's work, and has helped to explore:

- the social impacts of the Environment Agency's work, including health, employment, education, levels of deprivation and social inclusion, quality of life;

- the social processes of communication, relationships and decision-making which underlie everything that the Environment Agency does. These in turn reflect issues of trust, openness, risk management, involvement, consultation, participation, inclusion, partnership, influence, education, learning, ownership, authority, power and control;
- the different social values and perspectives through which different parts of society (including the Environment Agency) define the environment and the ways in which it matters.

A desk-based review of the evidence of social issues, undertaken as part of this project, was instrumental in highlighting the relevance of social justice and social inclusion to environmental policy and the importance of understanding the links between the environment, poverty and health (Warburton, Levett, and Pilling, 2005). At the same time the Environment Agency's staff were beginning to find that social exclusion and disadvantage were becoming increasingly important to their work. During a series of facilitated discussions and regional workshops, staff commented that:

- *"[There is a] huge percentage of socially deprived communities in Wales, which is a particular challenge for EA Wales"* [participant at Wales workshop];
- *"Disadvantaged urban communities experiencing social exclusion is a priority"* [participant at Midlands Region workshop];
- *"[The] Agency's own practices (eg procurement) don't support inclusion and social priorities"* [participant at workshop in Wales];
- *"[The] Agency needs to work with excluded groups, including those with disabilities, in recognition of their statutory responsibilities"* [participant at Thames Region workshop]. (Warburton, Wilkinson, Christie and Colvin, 2005).

In its review of the Environment Agency's current activities and thinking on environment and social justice in March 2002, the Joining Up project suggested that further research is needed to:

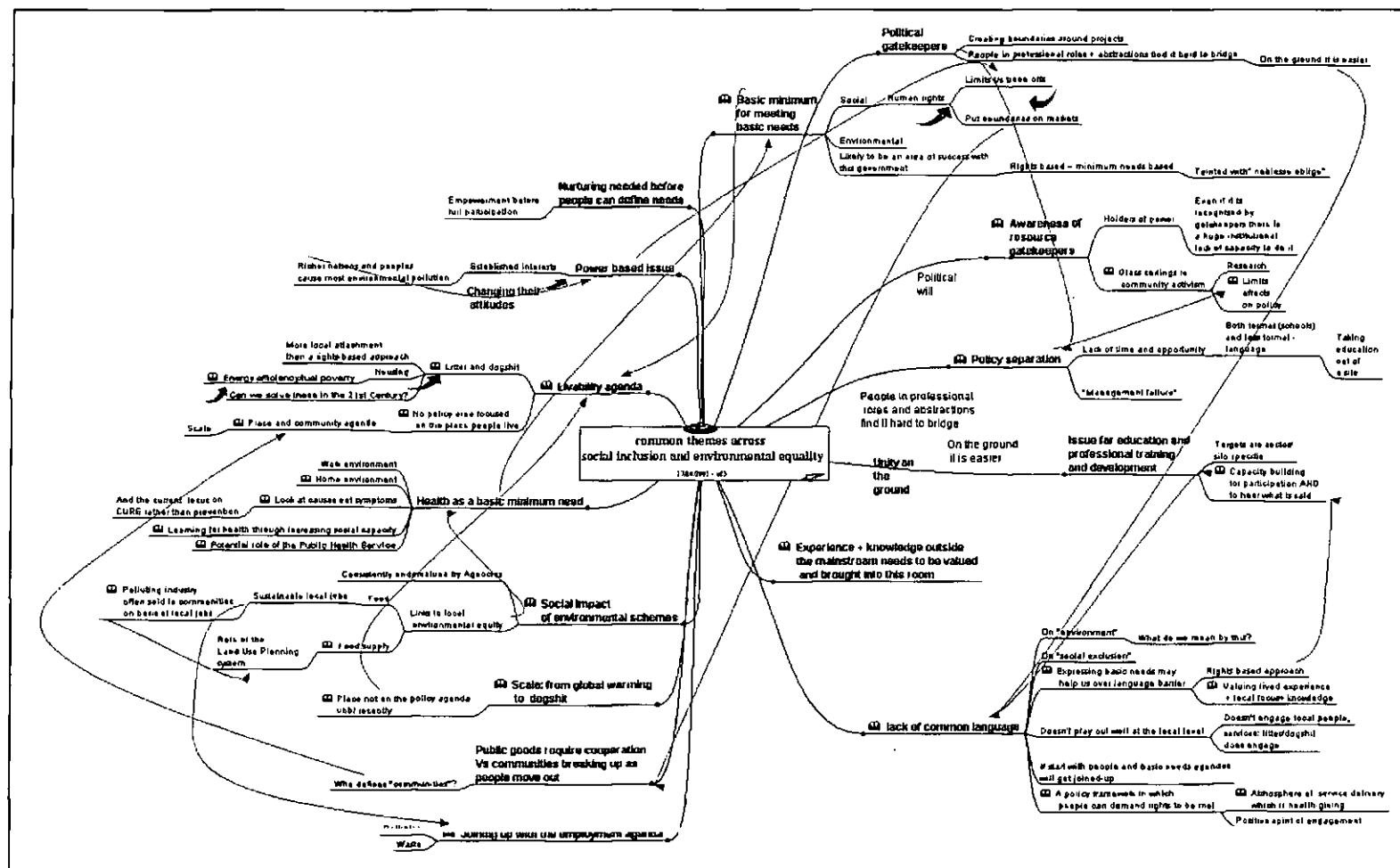
- understand the role of the environment in urban and rural regeneration, as a constraint and an opportunity; and
- develop action learning networks, and possibly centre, to examine and develop good practice in [understanding the] links between environmental issues, social inclusion and social justice (Warburton, Levett, and Pilling, 2005).

'Mapping Common Ground' on environmental equality

The next step taken by the Social Policy Manager was to jointly sponsor with Capacity Global a 'Mapping Common Ground' event. This event, held in October 2001 brought together people from government, NGOs and the academic community to map the issues and current work relating to environmental equality and social inclusion (see figure 1.10). The participants suggested that:

- the three 'legs' of sustainable development: environmental, economic and social progress should be better joined up;
- the social impacts of environmental schemes were being undervalued by government agencies;
- there is a lack of common language and understanding of the concepts of social exclusion and environmental equity; and
- there is a need to bring the experience and knowledge outside the mainstream, into the policy process, and improve the relationships between policy makers and communities.

Figure 1.10: Common themes across social inclusion and environmental equality



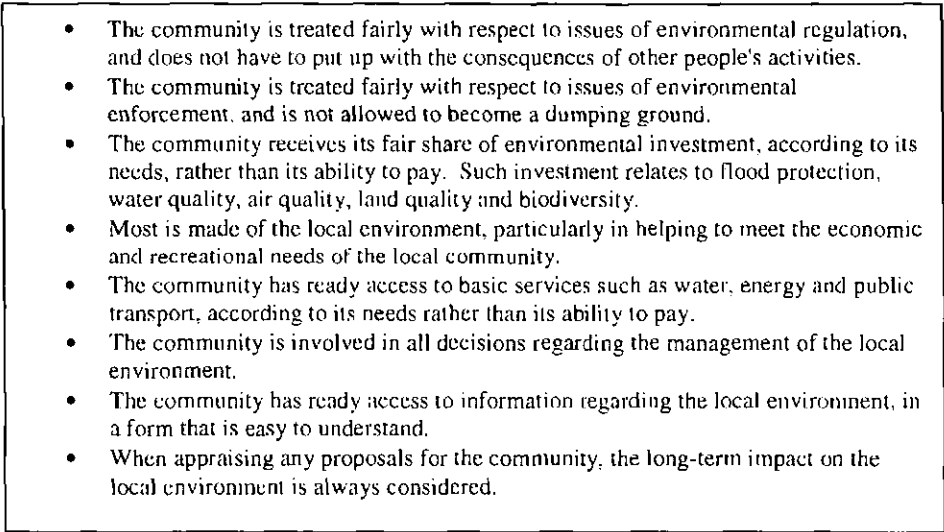
Source: Warburton (2001). *Mapping Common Ground on Environmental Equality*.

Building understanding of environmental equity with government

Thirdly, a number of meetings were held between the Environment Agency and government to discuss these issues:

- (i) A meeting between Defra's Sustainable Development Unit and Environment Agency Directors on 26 October 2001 on 'environmental equity and the polluter pays principle' recommended that the Environment Agency identify the obstacles which might currently prevent the organisation from taking account of the social dimensions of sustainable development (Robb, 2001).
- (ii) A subsequent paper by the Social Policy Manager to the Environment Agency's Directors for the Policy Steering Group³ in November 2001 recommended a clear policy and research framework relating to 'Social Deprivation and the Environment' (Mance, 2001);
- (iii) In its response to the National Assembly for Wales' consultation on the programme, Environment Agency Wales proposed a series of benchmarks for the Communities First programme (Poole, 2001), see figure 1.11.

Figure 1.11: Environmental benchmarks for the Communities First Programme

- 
- The community is treated fairly with respect to issues of environmental regulation, and does not have to put up with the consequences of other people's activities.
 - The community is treated fairly with respect to issues of environmental enforcement, and is not allowed to become a dumping ground.
 - The community receives its fair share of environmental investment, according to its needs, rather than its ability to pay. Such investment relates to flood protection, water quality, air quality, land quality and biodiversity.
 - Most is made of the local environment, particularly in helping to meet the economic and recreational needs of the local community.
 - The community has ready access to basic services such as water, energy and public transport, according to its needs rather than its ability to pay.
 - The community is involved in all decisions regarding the management of the local environment.
 - The community has ready access to information regarding the local environment, in a form that is easy to understand.
 - When appraising any proposals for the community, the long-term impact on the local environment is always considered.

- (iv) In a 'brainstorm' meeting on 21 February 2002, Defra, the Environment Agency, Groundwork UK and researchers agreed three major themes for environmental equality: environmental protection and health, sense of place and environmental quality, and access to environmental resources.
- (v) In a briefing for a bilateral meeting between the Environment Agency and Michael Meacher, Minister for the Environment on 12 June 2002, the Social Policy Manager highlighted the ways in which the Environment Agency was taking a proactive approach towards working in poorer communities.
- (vi) In July 2002, the Social Policy Manager provided comments on a 'Scoping Note for a Cross-Governmental Study in Environmental Exclusion' being drafted for the Social Exclusion Unit.

Analysis of environmental data

In early 2002, the Environment Agency undertook a preliminary analysis of a range of environmental data sets and the government's Index of Multiple Deprivation for geographical wards in England. Overall, these data indicated that there are links between environmental quality and deprivation, particularly in a number of areas for which the organisation has regulatory responsibilities (for example IPC sites, landfills, water quality) (see figure 1.12). The Environment Agency recommended that:

- further analysis be undertaken of broader environmental data sets; environmental quality and deprivation in Wales;
- the potential causality in the relationships;
- the multiple factors which may affect the impact of e.g. landfill sites on the local population; and
- the compounding effects of poor environmental quality on health of the conditions associated with multiple deprivation.

³ The Policy Steering Group co-ordinates the Environment Agency's policy programme, championing effective policy development and advocacy processes, particularly in relation to key, outward-facing, cross-cutting policy priorities. Environment Agency PSG Terms of Reference, 25 September 2001.

Figure 1.12: Relationships between deprivation & environmental quality

Environmental Data Set	Relationship to Deprivation Band
Density of IPC sites	Largest density in areas <u>most</u> deprived.
Density of landfill sites	Greatest in the <u>most</u> deprived wards.
Density of sewage treatment works	More in the forty per cent <u>least</u> deprived wards than others.
Exceedance of nitrogen dioxide annual mean air quality standard	75% most deprived wards exceed standard and about twenty per cent least deprived wards, although this rises to forty per cent in the very least deprived wards. Clear link with deprivation and urban areas.
Exceedance of air quality standard (annual mean) for particulates	No areas exceed the annual average standard. The highest concentrations occur in both the <u>least</u> and <u>most</u> deprived wards.
Exceedance of ozone air quality standard	<i>Number of days standard exceeded is 1.5 times greater in <u>least</u> deprived areas than in <u>most</u> deprived areas.</i>
River habitats	Up to fifty per cent sites extensively modified (less natural) in the <u>most</u> deprived areas.
River quality (chemically)	Rivers in deprived areas are poorer in quality than in less deprived areas.
River aesthetic quality	No pattern.
<i>Source: Environment Agency (2002b). The Urban and Environment in England and Wales: A Detailed Assessment. Bristol: The Environment Agency, p91.</i>	

Early direction from Directors

As a result of this study, in June 2002, Directors at the Environment Agency's Policy Steering Group asked for further research to be undertaken which would:

- improve the Environment Agency's understanding of the relationships between social deprivation and environmental quality, particularly within its priority areas;
- help clarify the Environment Agency's role in addressing environmental inequalities; and
- help ensure that the environment is recognised as an important dimension of disadvantage in others' strategies at national, regional and local level.

This earlier research by the Environment Agency had largely supported existing studies which suggested that the most socially and economically disadvantaged people live in the worst environments. However, only a small number of environmental issues had been examined in England, and few studies had been undertaken in Wales, or to understand the causes of these inequalities. These linkages between social deprivation and the environment were increasingly being recognised and articulated in research by various NGOs and communities and in a

growing number of speeches by government ministers. Yet these connections with the environment were often being missed in the development of key policy initiatives for tackling social, economic and health inequalities. By understanding its contribution to sustainable development, the Environment Agency was beginning to understand its social responsibilities and articulate the importance of tackling degraded environments in socially disadvantaged areas, and of promoting environmental equality. As well as the Environment Agency's AGM, workshops and the publication of *Our Urban Future* – an assessment of the urban environment had also helped to encourage discussion about these issues with a range of external stakeholders (Environment Agency, 2002a).

There had been clear leadership from the Environment Agency's Chairman and explicit reference to these responsibilities in the Environment Agency's *Vision*, as well as a corporate target which challenged the organisation to focus its local partnership work on disadvantaged areas, alongside substantial work to understand the Environment Agency's social responsibilities. However, what was still not clear was what the organisation's role should be in tackling environmental inequalities, or what was needed to change the way it improves and protects the environment to maximise this contribution to sustainable development. All of these issues were considered in the development of the overall aim and objectives for this project, both of which are described in section two.

2. AIMS AND OBJECTIVES OF THE RESEARCH PROJECT

2.1 Aim: To strengthen the Environment Agency's contribution to sustainable development

This project was undertaken for the Environment Agency, whose primary role is to contribute to sustainable development through its role in improving and protecting the environment. I was employed within the Sustainable Development Unit (which later became the 'Policy Development and Promotion' team) to undertake a doctoral project in sustainable development which would 'deeply analyse and develop a key sustainability issue for the Environment Agency' (Newton, 2000). My role in this project as the worker-researcher will be discussed in more detail in section three and four.

Environmental equality and addressing the unequal distribution of environmental quality had already been identified as key challenges for the Environment Agency in delivering its *Environmental Vision*. This project was designed to understand these issues and how this could best be achieved through the Environment Agency's two roles: protecting and enhancing the environment, and acting as an influential advisor.

The overall aim of this project was to:

To strengthen the Environment Agency's contribution to sustainable development by developing a policy position on environmental equality.

Three objectives were important in achieving this overall aim:

2.2 Objective 1: To improve the Environment Agency's understanding of the relationship between environmental quality and social deprivation

Existing research had revealed some evidence of correlations between social and economic deprivation and various aspects of environmental quality. However, considerable work was needed to understand the relationships better; their causes; and the policies and processes which affect them.

In order to address these needs, a number of questions needed to be answered:

- What do we already know about the relationship between environmental quality and social deprivation?
- What gaps exist in the current evidence base which restrict the development of an Environment Agency policy on environmental equality?
- What is the value of doing further analysis in this area?
- What are the priorities for further Environment Agency research and policy development?
- What is the nature of the relationships between environmental quality and social deprivation?
- Do inequalities exist in the distribution of environmental quality?
- If so, what might be the causes of these inequalities?

This project was designed to help answer these questions and develop further analysis to help the Environment Agency and other policy makers understand these issues and how best to address them. The analysis was intended to help deliver a better understanding of the relationships between environmental quality and social deprivation, particularly amongst those who will be involved in implementing the changes needed to address environmental inequalities. Therefore, the analysis needed to be relevant and appropriate to its users.

2.3 Objective 2: To clarify the Environment Agency's role in addressing environmental inequalities

The second step was to review the organisation's role in contributing to this agenda. This raised a number of questions:

- Does the Environment Agency care about environmental inequalities? If it does not, should it?
- What overall policies, processes and practices affect environmental inequalities?

- What is the organisation already doing to improve and protect the environment in deprived areas?
- Is this approach working? If not, what does the Environment Agency need to do differently?
- How should the Environment Agency further address environmental inequalities through its own policies, process and practices?
- How can these changes be integrated into the Environment Agency's current approach to improving and protecting the environment?

This project addressed these questions, and in doing so also helped to improve the Environment Agency's understanding of its role, and create change in the organisation's approach to sustainable development.

2.4 Objective 3: To ensure that others' policies and strategies address environmental inequalities

The policies and processes of other actors, such as government, business and individuals, may also affect environmental inequalities. Through its role as an advisor to government, the Environment Agency can help influence these factors through working with key stakeholders and promoting key messages to others through the use of external-facing policy positions. But first this project needed to understand:

- Whose policies, processes and practices affect environmental inequalities?
- What would make the most difference to promoting environmental equality?
- What changes should the Environment Agency be advocating to others to help address environmental inequalities?
- Are there any examples of work others are doing to promote environmental equality that the Environment Agency should be supporting?

Project boundaries

Sustainable development and environmental equality is a vast and complex area of research and policy. The resources made available to this project were limited.

Therefore the objectives needed to be realistic and achievable. Boundaries around what the project would - and would not - deliver were negotiated between different stakeholders throughout the development of the project. In particular, it is important to highlight that the project:

- (i) focused on understanding the distribution of environmental outcomes. Environmental justice comprises a number of issues, including intra- and intergenerational justice, rights and responsibilities, substantive and procedural justice (see Dobson, 1999; ESRC, 2001; Agyeman, Bullard and Evans, 2003). Because of the Environment Agency's focus on environmental outcomes, this project was primarily concerned with the substantive aspects of environmental justice, i.e. the distribution of environmental outcomes, rather than considering judgements of injustice. Nonetheless, it was necessary to consider the social and political processes which cause these inequalities, and therefore engage with projects which examined these procedural aspects, for example, the Environment Agency's Legal Services' work with Defra on transposing the Aarhus Convention in the UK.
- (ii) focused on the relationship between environmental quality and multiple deprivation. Existing research has identified several social groups that disproportionately suffer from environmental injustice, for example ethnic minorities, people on low-incomes, and children. Current government policy on tackling inequalities through neighbourhood renewal, uses multiple deprivation to characterise the social groups and geographical areas that it wishes to target. The Environment Agency's existing analysis in this area, which used the government's Index of Multiple Deprivation to analyse the relationship between environmental quality and disadvantage, also provided an important precedent and foundation on which to base new – and potentially controversial analysis.
- (iii) analysed the relationship between deprivation and three environmental hazards: flooding, air quality, and the location of IPC sites. As will be explained in more detail in section four, to gain an in-depth understanding of environmental inequalities, the analysis focused on just three environmental

issues of importance to the Environment Agency. These were decided through a detailed selection process, and in negotiation with the project's 'customers': the Environment Agency's policy staff and external stakeholders. These issues were used to understand the Environment Agency's wider role in addressing environmental inequalities.

- (iv) concentrated on developing a policy position for the Environment Agency, as these are the main products developed by Environment Agency policy staff to help influence others, for example, government and business. Policy positions set out the organisation's medium to long term ambitions for policy in an area (generally three to five years or longer), and detail what action it calls for external bodies to take. But it is important to note that the Environment Agency also articulates its policy positions through other media, such as reports, responses to consultations, verbal communication, its operations, and in the actions and behaviour of its staff.
- (v) primarily sought to influence the government's approach to neighbourhood renewal and the UK Sustainable Development Strategy. These were identified as being the most effective levers in influencing approaches for tackling disadvantage and wider government policy⁴. The forthcoming review of the 1999 UK Sustainable Development Strategy in 2004 provided an opportune focus for this project, and its wider influence on government policy across England, Wales, Scotland and Northern Ireland.

2.5 Personal learning outcomes of this project

The nature of this project as a work-placed doctorate, and the demands it placed on me as a worker-researcher, meant that this project was ideally placed to help develop my own learning and contribute to my professional development. In particular, I was keen to develop my understanding of sustainable development. At the end of

⁴ Meeting between the Head of Environmental Policy, The Head of Policy, Development and Promote, the Social Policy Manager and the worker-researcher (8 May 2003) Advocacy strategy for environmental equality. Rio House, Bristol.

my Masters in Professional Studies (MProf) in 'Leadership for Sustainable Development' (which contributes towards the fulfilment of this doctorate). I described my original definition of sustainability:

'my personal commitment to encouraging others to realise their democratic role in global governance for effecting change in their own lives; and promoting and maintaining fulfilling and healthy lifestyles that will not impinge on the social, economic and environmental long term wellbeing of people and planet' (Chalmers, 2001:5).

Fundamental to my understanding of sustainable development is the interconnectedness between the local and global environment, its utility for meeting human needs and well-being, and the moral role of people in protecting the environment (Chalmers, 2001:201). The MProf also strengthened my belief in the importance of leadership, my role in building the capacity of individuals and organisations to promote sustainable development and the need to be pragmatic in accepting people's 'enlightened self-interest' in acting as environmental citizens to improve their own lives.

In order to effect change within and outside the Environment Agency through this project, and contribute to my professional field (sustainable development practitioners and policy managers), I needed to further develop my abilities in leadership, influencing, policy and project management. The specific learning outcomes that I sought to achieve through this project are described in figure 2.1.

Figure 2.1: Desired learning outcomes from this DProf project

Cognitive	
Knowledge:	<ul style="list-style-type: none"> doctoral thesis which investigates the issue of social deprivation policy in the context of environmental equality and sustainable development policy position on environmental equality with a rationale for the policy development process
Analysis:	<ul style="list-style-type: none"> analysis of complexity, lacunae and contradictions in the knowledge base about environmental equality presented in the literature review selection of appropriate analysis tools through comparative analysis of research methodologies
Synthesis:	<ul style="list-style-type: none"> synthesis of literature about research methods, social justice, environmental equality, sustainable development and environmental policy documents to create approaches to policy development development of an inclusive policy development process addition of new (social justice) dimension to existing understanding of environmental policy and practice
Evaluation:	<ul style="list-style-type: none"> evaluation of appropriate methodologies and alternative approaches to policy development report and reflection on own project work and the contribution of others' (projects)
Transferable skills	
Self appraisal reflection on practice:	<ul style="list-style-type: none"> engagement of 'critical communities', key and appropriate stakeholders as part of: a) the stakeholder panel to oversee the research, b) interviews with key internal stakeholders, c) the policy development process, d) action learning with key internal groups Learning diary used to reflect on the practice of the worker-researcher and others
Planning management of learning:	<ul style="list-style-type: none"> autonomous study and management of doctoral project utility of Environment Agency, Middlesex University and other resources in support of self-directed study (e.g. library, experts and supervisors) awareness of political implications of the study evident through justification of methodologies and impacts of the project, consequent decisions and self reflection
Problem solving:	<ul style="list-style-type: none"> identification of and management of predictable and unpredictable problems through self-reflection; this will be captured in a learning diary
Communication / presentation:	<ul style="list-style-type: none"> examples of communication (written and oral) to professional and academic communities of practice throughout project (eg papers to Policy Steering Group, journal articles) presentations to internal groups (eg Policy Promotion Managers, Areas) and external stakeholders (eg conference papers)
Research capability:	<ul style="list-style-type: none"> justification and methodology for selecting research methodologies, with recognition of limitations and possibilities inclusion of a variety of representative voices in project planning, development, data collection and review to ensure that the outcomes of the project are valid and reliable
Operational context	
Context:	<ul style="list-style-type: none"> literature review to demonstrate context of project and current limits of research and practice to inform project as proof of innovative nature of project
Responsibility:	<ul style="list-style-type: none"> self-reflection on the positionality of the worker-researcher and the relation to the research process and subjects
Ethical understanding:	<ul style="list-style-type: none"> analysis of ethical dilemmas anticipated and experienced in research and professional practice
<p>Source: Chalmers, H. (2002). <i>Doctorate in Professional Studies DPS 4521: Programme Planning and Rationale, Learning Agreement.</i></p>	

3. APPROACH AND METHODOLOGY

This section will outline the overall approach and methodology employed for this project. Firstly, I will reflect on how the context and drivers for the project led me to identify particular principles affecting the design and approach of the project. Secondly, I will introduce the concept of action research, and how it informed the research process. Lastly, I will outline how specific research techniques were used to gather different types of information and data to address the project objectives.

3.1 Principles for developing the research and policy development process

Taking into account the issues explored in sections one and two; it was critical that the research process:

- (i) built on the Environment Agency's existing quantitative analysis on the relationship between environmental quality and multiple deprivation;
- (ii) developed practical solutions to environmental inequalities by actively developing dialogue around environmental equity with different research users and the policy community;
- (iii) learned from the practical experience and knowledge of Environment Agency staff and external policy makers, researchers and practitioners who would be involved in implementing any changes;
- (iv) developed the Environment Agency's relationship with external stakeholders (for example, by building on the contacts established through the 'Mapping Common Ground' event);
- (v) interacted with parallel research inquiries both within the Environment Agency (for example the Joining Up project), and those being carried out by others (e.g. within government);
- (vi) was flexible to the changing political context; to the Environment Agency's pace of organisational change; and to external influences, so that the project could make timely interventions;
- (vii) enabled me (as the worker-researcher) to be involved in the research process, whilst understanding my own positionality and the choices which influenced the decision-making process.

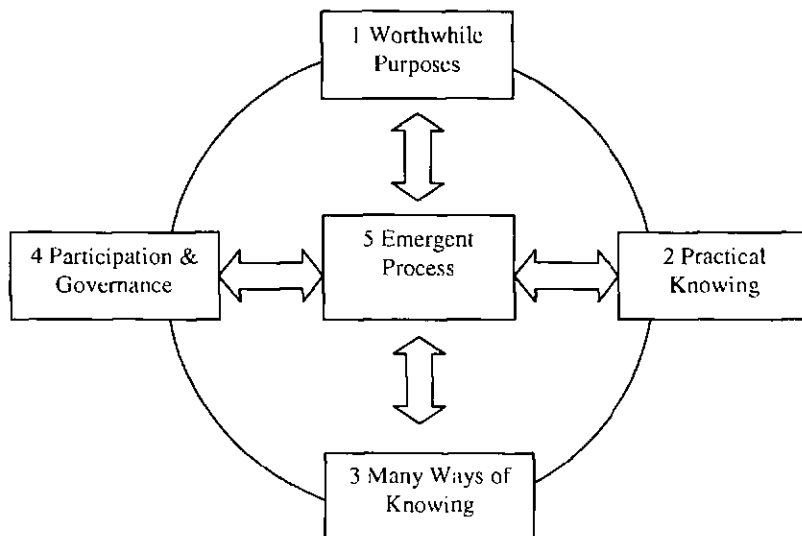
3.2 Action research

An action research perspective lent itself to this process, because of its focus on many of these elements: democratic, participative processes; practical problem solving; social change; and cycles of action and reflection.

Peter Reason and Hilary Bradbury describe action research as:

'a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities' (Reason and Bradbury, 2001:1).

Figure 3.1: Characteristics of action research



Source: adapted from Reason, P. (2003). 'Choice and quality in action research practice'. Bath: University of Bath, School of Management Working Paper Series.

To understand the justification for using an action research perspective, it is useful to return to the overall aims and objectives of this project. The project aimed to strengthen the Environment Agency's contribution to sustainable development by

developing a policy position (and by implication – promote) environmental equity within the practice of the Environment Agency and others. But I will also use the characteristics of action research (summarised in figure 3.1) to discuss the relevance of an action research approach to the project.

3.2.1 Worthwhile purposes

Central to the idea of action research is the purpose for which research is conducted – to make the world a better place. Or as Robin McTaggart puts it:

'the aim of participatory action research is to change practices, social structures, and social media which maintain irrationality, injustice, and unsatisfying forms of existence' (Robin McTaggart, quoted in Reason & Bradbury, 2001)

Action research is often used to promote social change and places a strong emphasis on developing research for the general good – to benefit people, their communities and environments (Revans, 1983). It can provide a useful approach for creating the right conditions for both change within the organisation. This is consistent with the purpose of the research which was the pursuit of environmental justice, through seeking to change and modify human systems, social contracts and behaviour. Action research does not assume that the pursuit of new knowledge is worthwhile in itself, but instead enables us to consider how the ways in which we create new knowledge can help change the policies and practices that lead to environmental injustice.

3.2.2 Practical knowing

If we consider worthwhile research as that which changes people's perspectives and behaviour, then a primary value of action research is its emphasis on 'practical knowledge that is useful to people in the everyday conduct of their lives' (Reason and Bradbury, 2001:2). What really matters is that the knowledge we create means something to the people who are going to use it. This forces us to consider the ways in which we have created knowledge, how it will be used and how it has helped

change the practices that lead to environmental injustice. This implied developing a research process which would firstly involve the intended users of the research in the construction of knowledge about the relationships between environmental equality and social deprivation, and the policy drivers that affect these relationships; and secondly build their capacity to use this knowledge to effect the changes needed.

Firstly, we recognised that the Environment Agency's own staff, in their day to day jobs, would already have substantial knowledge and experience of these relations. Through their different roles in improving and protecting their environment, they may know how the quality of the environment might vary between different geographical, and affect different social groups experiencing multiple deprivation. It was therefore important to draw on this knowledge to inform the evidence base. We also needed to gain insights into how the organisation's staff understand and interpret the organisation's role within their own practice. For example, as an organisation, the Environment Agency's role is defined and shaped by a wide range of factors – both formal and informal processes (Hailey and Smillie, 2001). Statutory guidance, our policies, regulatory frameworks, as well as behaviours and actions of the its staff all shape the ways in which the Environment Agency approaches its work. In the words of Davenport and Prusak, organisational knowledge 'becomes embedded not only in documents and repositories, but also in organisational routines, process, practices and norms' (Davenport & Prusak, 1998). The research process therefore had to involve the users of the research in constructing our understanding of environmental inequalities.

Secondly, the emphasis within action research on practical knowing is also congruent with another aspect important to my manager and I – our interest in shaping policy that can usefully inform implementation. To do this it would be necessary to find ways of linking local (on the ground) experience and understanding of environmental inequalities with the wider policy context, and of ensuring that policy was designed so that it could make a practical difference on the ground.

We sought to use the research and policy development process to identify solutions and develop opportunities for creating change within the policies and practices of other organisations whom the Environment Agency seeks to influence. An action

research approach was helpful in a number of ways. Firstly, it allowed me with colleagues to shape others' solutions through a process of collaborative inquiry and negotiation with those involved in implementing the change on the ground and senior policy makers within the government's hierarchy. As Richard Rorty suggests, 'the purpose of inquiry is to achieve agreement among human beings about what to do, to bring consensus on the end to be achieved and the means to be used to achieve those ends' (Rorty, 1999).

At the same time, I also sought to raise awareness of the Environment Agency's role in addressing environmental inequalities by working with staff to explore their own knowledge and experience. Fundamental to action research is the process of 'conscientization' – a term popularised by Friere for a 'process of self-awareness through collective inquiry and reflection' (Friere, 1970 in Reason, 2001). Using this approach provided me with the opportunity to build their capacity by involving them in the construction and use of their own knowledge. This could have been achieved through an ethnographic approach, which would have enabled me as the worker-researcher to act as a participant in the policy community. However, through the act of observation, the approach would have prevented me being involved in the process of change experienced by the group being researched (i.e. Environment Agency policy makers). In contrast, action research aims to change and modify human systems, social contracts and behaviour. This approach is therefore particularly suited to a work-based learning project as it focuses on the researcher improving the aspects of their own and their colleagues' practices (NCWBLP, 2001:32).

3.2.3 Many ways of knowing

This in turn would mean finding ways of linking local and national perspectives – and of bringing together the potentially different types of knowledge underlying these. As Ballard et al highlight in their think piece on action research and sustainable development, sustainable development is complex, value-laden and socially constructed, requiring a multi-disciplinary approach. So, in understanding the relationship between environmental quality and social deprivation, it was important that the project drew on diverse perspectives and ways of creating knowledge (Ballard et al, 2003). I was also aware that the project would need to

build bridges between different organisations and different disciplines, often with different underlying practices and ways of thinking – a key challenge of sustainable development.

Early on in the research process, my manager and I drew up a map of the different stakeholder constituencies that we would need to work with to draw out different understandings of the key issues, develop practical policy-relevant solutions and jointly develop a policy narrative (figure 3.2). Action research enabled me to combine both quantitative data analysis and the practical experience and views of Environment Agency staff and external stakeholders.

Figure 3.2: Stakeholder constituencies targeted through the research process

<div>Partnership Officers</div> <div>Customer Service Managers</div> <div>Area Managers</div> <div>Strategic Environmental Planners</div> <div>Regional Strategic Units</div> <div>Regional Directors</div> <div>Environment Agency</div>	<div>Regional / local</div> <div>General public</div> <div>Local Strategic Partnerships partners</div> <div>Local Authorities</div> <div>Government Offices</div> <div>Regional Assemblies</div> <div>External stakeholders</div>
<div>Environmental Policy Advisors</div> <div>Regulatory Policy Managers</div> <div>Flood Risk Advisors</div> <div>Directors</div> <div>Chief Executive</div> <div>Chairman</div>	<div>National</div> <div>Practitioners & consultants</div> <div>Non-Governmental Organisations</div> <div>Statutory Agencies</div> <div>Academics / Researchers</div> <div>Media</div> <div>Government departments</div> <div>Ministers</div>

Other approaches were also considered, such as a soft systems methodology, which incorporates many of the same aspects of an action research approach. It provides a useful approach for making changes which are both systematically desirable and culturally feasible, and provides opportunities to compare an abstract model to a real world. Yet to understand the rich picture of what was happening in the real world would have required in-depth research within a community, such as a small-case study, which was not feasible within the scope of my project.

3.2.4 Participation and governance

Working with multiple stakeholders and voices raises important issues regarding participation and governance. This is an area where action research has much to offer, as participatory inquiry and practice have informed action research traditions since these first emerged in the 1940s. Indeed, some would now argue that action research is itself located within an emerging participatory worldview (Goodwin, 1999; Reason & Bradbury, 2001). It was clear that the research process would need to involve the Agency's stakeholders and enable them to develop appropriate definition and ownership both of the research and of the policy and practice arising from it.

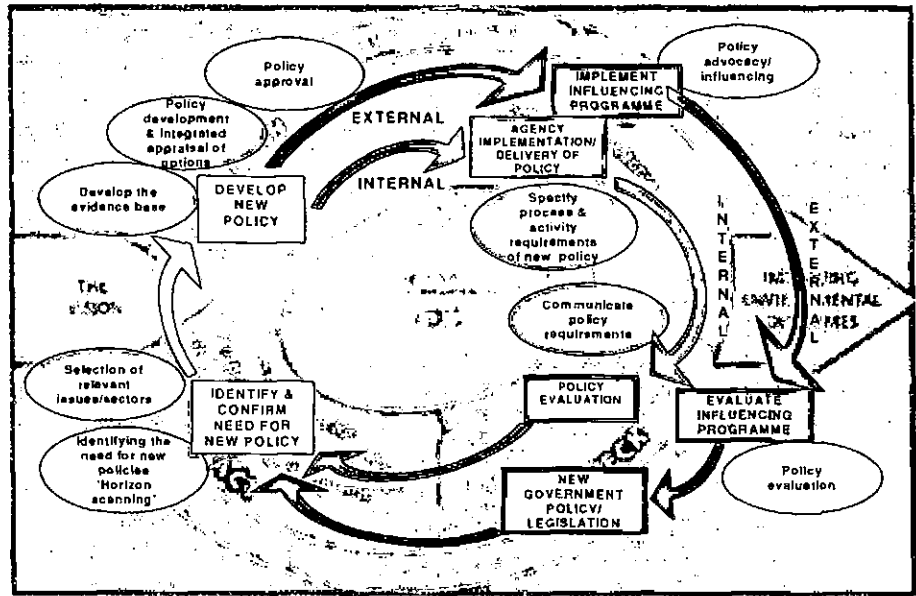
3.2.5 Emergent process

A final and major consideration for us in selecting our research approach was the need for flexibility. We needed an approach that could respond to the inherently political and evolving nature of working in a new and challenging area of policy development. We also needed an approach that could match the pace of organisational change within the Environment Agency. It should also help us to take advantage of unexpected developments and so to make timely interventions, both within the organisation and beyond it. More often than not, it took longer than expected to organise meetings and gain agreement for progressing some of the project activities. New and unexpected events required attention, and frequently influenced the course of the project. Action research provides the flexibility to be responsive to the changing context and the participants' and research subjects' own pace enabled me to make timely interventions.

Action research is again well suited to these needs, as it has an emergent rather than programmatic form. We also hoped that locating our approach within an action research tradition would provide us with a sufficiently robust framework to challenge the linear, rationalist approach to project management that continues to be dominant within the Environment Agency. Although a high risk strategy, the benefits of action research were increasingly becoming recognised through the

Environment Agency's cyclical process for policy development (seen in figure 3.3), and the action research and action learning approach adopted by the Joining Up project, and led by the Social Policy Manager.

Figure 3.3: The Environment Agency's cycle of continuous improvement for internal and external facing policy

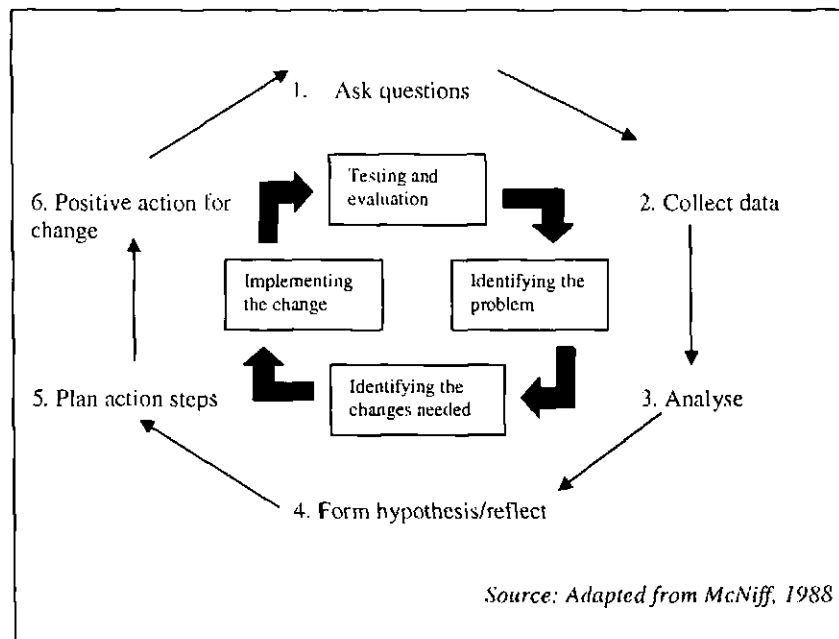


Source: Environment Agency (2004b). *AMS Procedure: Develop and Manage Policy* 82_03, Version 1. 25/04/03, Richard Howell.

Indeed, my manager's experience of participatory approaches to inquiry, and my own developing interest in action research led us to believe that, as an approach action research was best suited to the both the project, and our own styles of research and policy development. The Environment Agency's 'cycle of continuous improvement' builds on many models of action research, and includes the four key stages of 'plan', 'do', 'check' and 'act'. While it provides a useful model, it does not allow for making multiple and complex connections between the stages of what is essentially a linear process, and leaves little room for reflection and learning. In examining other models of action research, I found Mc Niff's 1988 model and the complementary cycle of reflection provided in her 1998 model particularly useful. I have adapted these by breaking down the second stage into two distinct steps (see figure 3.4), which require different research techniques and activities.

1. Identifying and clarifying the problem (plan);
2. Identifying the solutions and what is needed to change (observe);
3. Implement the change (act); and
4. Test and evaluate the impact of this change (reflect).

Figure 3.4: Action research cycle



For example, the process for investigating the relationship between social deprivation and tidal flooding, the Environment Agency's role, and the necessary steps to address inequalities in the distribution of flooding involved the following steps:

- we identified the research questions with multiple stakeholders;
- collated existing evidence through a literature review;
- collected qualitative data through a workshop;
- analysed secondary quantitative data;
- formed hypotheses and joint understandings of the relationships between flooding and deprivation, and their causes;
- identified the necessary changes in policy and practice through a workshop;

- developed ideas on how best to implement them through a series of meetings with the relevant policy leads; and
- worked to implement change through processes of negotiation with government (see section 4.3 and 4.4).

This model was used to guide the whole project cycle. At the same time, each stage and activity within the project involved mini cycles of action and reflection.

3.3 The role of the worker researcher and project management

3.3.1 Role of the worker researcher

The worker researcher (and author) managed the action research process, with support from a core group of managers, advisors and consultants. As Social Policy Development Officer, I was specifically responsible for developing, managing and undertaking the project, its research, and policy development. I also acted as the main advocate for this area of work within – and outside the organisation. While I led the project and acted with autonomy, I was also accountable to – and sought the advice of the Social Policy Manager and my three colleagues in the Social Policy Team, within the wider Policy Development and Promotion Team. Here I was ideally placed to work across the Environment Agency's core policy teams such as flood risk management to air quality, as well as making links across other crosscutting areas of policy such as regeneration and transport policy. I was also able to work vertically through my advice to government, and by supporting the social aspects of the work of my operational colleagues in the Agency's Regional and Area teams. There were many benefits and challenges, as a member of staff in undertaking this research for the Environment Agency. In particular, my position as a worker-researcher enabled me to:

Benefits

- access formal information relating to the Environment Agency's role in environmental equality (eg policies and processes);

- access inside knowledge and personal insights into the Agency's organisational and staff culture;
- access internal expertise on social policy and sustainable development issues;
- build long-term and trusting relationships with Environment Agency staff at different levels for working collaboratively;
- develop informal relations and conversations with other staff (eg at the coffee machine);
- judge when and how best to respond to requests for information and make timely interventions.

Challenges

However, my position as the worker-researcher also presented many challenges and risks of:

- being too close to the problem (eg the organisation, people and policies which need to change);
- the research being too influenced by my own positionality and values;
- the organisation's priorities and desire to maintain the status quo leading me to take a conservative – not innovative approach;
- being side-tracked into other work activities and demands from others;
- balancing the need to deliver 'sound' objective science with activism in advocating value-laden positions;
- errors of consensus collusion – working to prove a case rather than encourage inquiry;
- leading the outcomes of the second and third-person inquiries that I facilitate and suppressing the discussion to meet the objectives of the project.

My role in developing specific parts of the project will be discussed in later sections.

3.3.2 Project advisors

The core group of Environment Agency staff who advised on the initial design of the process was:

- Helen Chalmers, Policy Development Officer and worker-researcher responsible for managing the project;

- Social Policy Manager, who had developed much of the organisation's thinking to date relating to environmental equality and social deprivation through managing the action-research orientated Joining Up project to develop the Environment Agency's Social Policy;
- Social Policy Advisor with interest and experience in stakeholder engagement and risk communication;
- Human Health Policy Manager and latterly Emma Hayes, Human Health Policy Advisor;
- Environmental Assessment and Reporting Manager, whose team undertook the Agency's analysis on social deprivation and environmental quality and wrote '*Our Urban Environment*' report in 2002;
- Planning and Reporting Principal Advisor; and
- Research and Development Co-ordinator, and latterly;
- a Senior Scientist.

I met these people frequently in the early stages of the project to design the research specification for the quantitative analysis and stakeholder Steering Group. Latterly, I was supported primarily by the Social Policy Manager, as my manager, with whom I met monthly to reflect on the process, and more frequently when needed. As the project progressed, there was increasing involvement in the design and management of the process by:

- the Head of Environmental Policy, who manages a diverse range of teams including Policy Development & Promotion, Risk & Forecasting, Economics, Climate Change and Planning;
- the Head of Policy Development & Promotion ('PDP'), whose team includes the Social Policy Team and others developing and advising on policy relating to: sustainable communities, urban regeneration, sustainable development, transport and sustainable production and consumption.

As my senior managers, I approached them to chair the Steering Group meetings and workshops, and provide a lead when negotiating with senior government officials and external stakeholders. We met at appropriate times to discuss critical parts of

the process and for advice on how to frame and position this project to external audiences. Managing their involvement in the design and development of the project was critical in maintaining their overview and support for different components of the process.

3.3.3 External consultants

External consultants also provided support at different stages of the project in their role as my supervisors, or were employed to undertake specific parts of the project:

- Dr. Carol Costley, Research Director, National Centre for Work-Based Learning Partnerships, Middlesex University;
- Dr. Helen Walker, Skills & Knowledge Team, Neighbourhood Renewal Unit, Office of the Deputy Prime Minister (ODPM) on secondment from the University of Westminster;
- Diane Warbuton, independent consultant who supported the Joining Up project;
- Ian Christie, Associate Director of the consultancy The Local Futures Group, senior research associate of Demos, and now Head of Economic & Sustainable Resources at Surrey County Council.

I met these consultants to reflect and obtain feedback on my progress in developing and writing up this project.

I also managed a team of consultants who were primarily responsible for undertaking the statistical analysis and research relating to environmental inequalities. The team was led by:

- Professor Gordon Walker, Director of the Institute for Environment and Sustainability Research, Staffordshire University with experience in research on technological risk management including land use planning and risk, local corporate social responsibility, environmental justice and patterns of risk distribution, renewable energy development and public participation in transport planning; and included

- Dr. Gordon Mitchell, Senior Research Officer, University of Leeds – an environmental scientist with experience in modelling water demand, diffuse urban pollution, and air quality;
- Dr. Jon Fairburn, Manager of the Geographical Information Systems (GIS) and Regional Data Laboratory at Staffordshire University, with experience in equity and related population research;
- Graham Smith, GIS and Regional Data researcher, who provided support in the mapping and analysis of data sets; with additional support provided by
- Professor Danny Dorling, Chair in Quantitative Human Geography, Leeds University - a recognised authority on the analysis of social and demographic data, and
- Sue Porter, Director of Sustainable Futures (consultancy), who supports the Joining Up project and provided process design and facilitation support for the first Steering Group meeting.

I managed this team during the scoping phase and analysis of quantitative data sets between February and July 2004. I also contracted Professor Gordon Walker and Dr. Gordon Mitchell to provide presentations at the Steering Group meetings and a workshop, and with whom I later co-wrote a paper about the research and its outcomes for *Sustain* magazine (Chalmers and Walker, 2004).

3.4 Stakeholder involvement in the project

The project was also steered by other Environment Agency staff and external stakeholders.

3.4.1 Environmental Equality Steering Group

In January 2003, I established a steering group to help steer the research process. Annex 2 introduces the purpose, membership and role of this group and reports on its first meeting. The aims of this group were to:

- (i) promote better understanding of the relationship between environmental quality and social deprivation;

- (ii) develop a research, policy and action process on environmental equality;
- (iii) contribute to developing new and existing networks of practitioners concerned with issues relating to environmental justice and social inclusion (Chalmers, 2003a).

While this project involved a wide range of activities, the group was specifically tasked with designing and taking part in the early stages of the 'research, policy and action' process (so-called to reflect the action research cycle) and to:

- evaluate existing data and research about the relationship between environmental quality and deprivation;
- identify gaps in current research, policy and practice which restrict the development of an effective approach to environmental equality; and
- develop priorities and a process for further Environment Agency research, policy and action involving a wider set of stakeholders.

When establishing this group, I considered the benefits and risks of using an 'action learning approach' with my colleagues in the Social Policy Team. This approach was pioneered by Reg Revans in the 1950s, where people work together in small groups or 'sets' on important organisational issues or problems and learn from their attempts to change things. The intention was to involve external stakeholders in the development of the research and policy options. However too many potential difficulties were perceived in creating the necessary conditions for open and supportive learning amongst a diverse range of Environment Agency staff and external stakeholders. In addition, there was a need to maintain the Environment Agency's autonomy in managing the project, and, for example in considering and acting upon the recommendations proposed by the consultants and steering group.

I purposely selected Environment Agency policy managers, and researchers, policy-makers and representatives from NGOs, whose work relating to the environment, health and disadvantage already focus on issues of environmental justice, or where environmental inequalities were likely to impact on their work. A list of participants is presented in the report of the first steering group meeting in Annex 2. As with each of the project groups, the decision to include and, therefore exclude, various

stakeholders was both difficult and critical to the process. Membership focused on selecting critical communities, principally those who would both support the Environment Agency's inquiry and challenge its thinking, whilst also acting to validate the research process and findings, which was the researcher's principal concern. As Brydon-Miller *et al* astutely point out '*conventional researchers worry about objectivity, distance and controls. Action researchers worry about relevance, social change, and validity tested in action by the most at-risk stakeholders*' (Brydon-Miller *et al*, 2003).

There were several key sectors absent from the group. In particular, the group did not include people from deprived communities living in poor quality environments, and people who work with these communities and manage the distribution of public goods e.g. planners, environmental enforcement officers. Indeed Lipsky reminds us of the importance of identifying these so-called 'street level bureaucrats', and not just focusing on high-level policy makers (Lipsky, 1980). To overcome this, we invited 'gatekeepers', such as members of NGOs who work with black and ethnic minorities and deprived communities (such as the Black Environment Network and Community Development Foundation) to reflect the views of these communities, as well as their organisations.

Care was taken to create an open, fair and transparent process and atmosphere amongst the steering group, which would enable all participants to contribute equally to the discussions, given the differences in roles, expectations, perspectives and power relations amongst the group. Where appropriate, confidentiality was maintained on issues that were clearly sensitive and difficult to discuss within a diverse group. For example, sensitivity was required where someone's personal view differed from his or her corporate position being expressed within the meeting.

Building trust was crucial in order to foster social learning within the group, and their ownership of the process, whilst maintaining clear boundaries between the Environment Agency's role as a participant and accountability to the group's recommendations. Steps were taken to ensure that the aims, terms of reference and role of the Environment Agency were made clear and agreed from the beginning.

This became increasingly important where the recommendations made by the Steering Group and the external consultants differed from the views of Agency staff.

Working with these groups and a wider range of individuals at different stages in the process proved challenging, especially where the researcher was often the only person who held the overview of the research and policy development process. Consequently the relationship was sometimes contractual, rather than co-operative. These relationships are complex, and often difficult to manage through an action research process, and were made more so by my interaction with other groups, individuals and parallel inquiries.

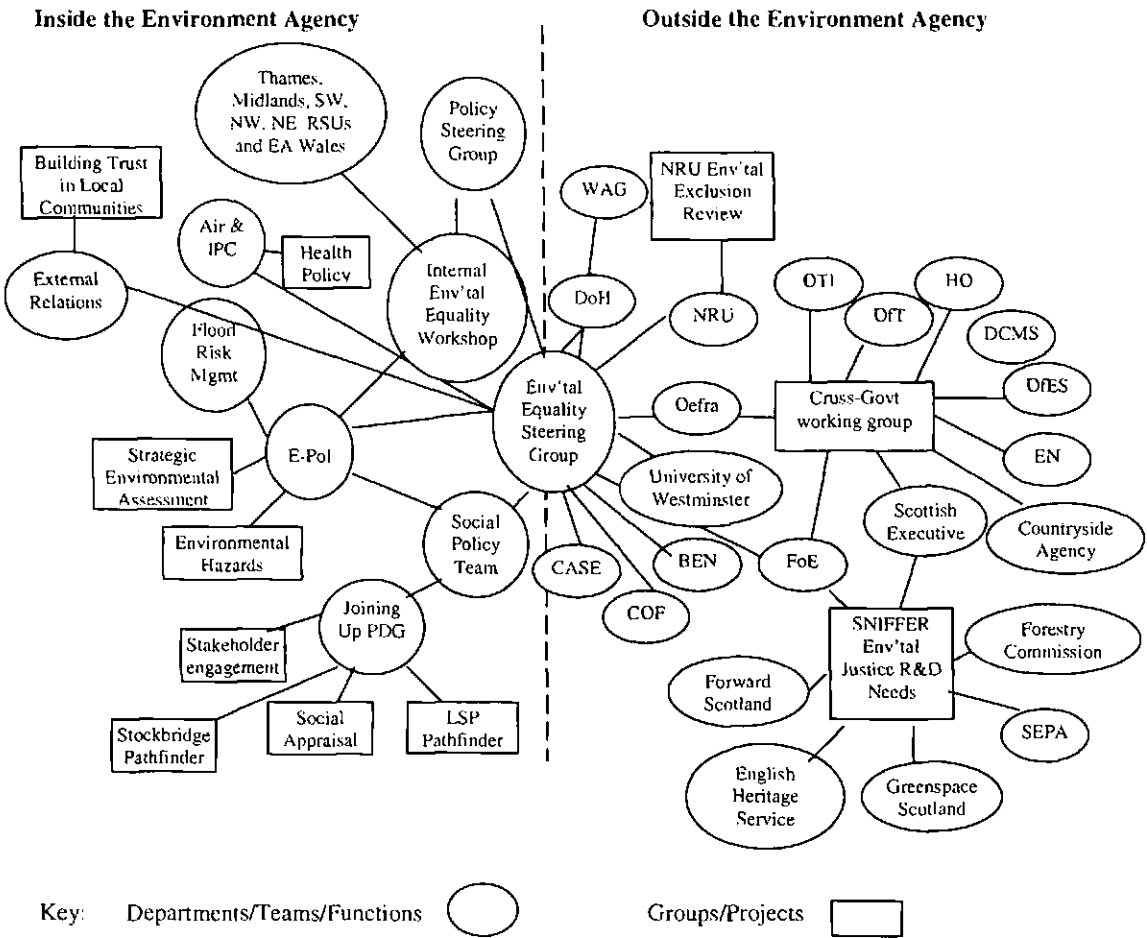
3.4.2 Relationships with other groups and projects

In order to maximise the learning about environmental inequalities, I created opportunities for interaction and cross-fertilisation with different groups and projects relevant to this research. Figure 3.5 illustrates the linkages made between these groups and projects both within and outside the Environment Agency. As the policy officer responsible and the central contact for this work within the Environment Agency, I was able to hold the collective knowledge about the linkages between the environmental inequalities work, and these various projects, teams, departments and individuals. Through my involvement and action with these groups and their individual members, I used various strategies of action research practice and methodological techniques to collect and analyse data.

3.5 Research techniques and data collection

A number of different research techniques were employed throughout the project to collect and analyse data, in order to address the three main research objectives. The main techniques employed were collaborative inquiry, documentary analysis, and quantitative data analysis.

Figure 3.5: Connections with other projects and groups



3.5.1 Strategies for collaborative inquiry

Reason describes three broad strategies of action research practice (Reason, 2001):

- First person action research or practice addresses the ability of the researcher to foster an inquiring approach to their own lives, to 'act awarely and choicefully, and to assess the effects in the outside world while acting';
- Second person action research or practice such as co-operative inquiry to address our ability to inquire face to face with others into issues of mutual concern, usually in small groups;

- Third person action research or practice includes a wide range of practices which draw together the views of large groups of people and create a wider community of inquiry, e.g. large inquiry groups and whole system conference designs.

During the project I used different techniques, adopting each of these strategies. In each instance, the questions used to focus the inquiry were shaped by the project objectives or agreed by the participants to address a mutual problem.

- (i) I also used first-person action research, touching on the four territories of experience which Torbert (2001) considers important to all good inquiries – to reflect on the way I and others:
- framed the perspective I/we were taking and the purposes we were pursuing;
 - advocated the Agency's position and role in addressing environmental inequalities in different contexts and to different stakeholders;
 - illustrated our dialogue about the relationships between environmental quality and social deprivation with examples from our own experiences and what was happening in the real world
 - inquired – by inviting my manager and others to provide feedback on my behaviour and action.

Using a collaborative approach with multiple relationships between different stakeholders inherently means that everybody's view should be taken as a contribution in creating and gathering data. As Winter explains, 'to work collaboratively does not mean that we begin by trying to synthesise them into a consensus. On the contrary, it is the variety of differences between the viewpoints that makes them into a rich resource' (Winter, 1996 in Zuber-Skerritt, 1996:13). To manage the quantity of data collected using these techniques required careful management of the relationships and groups with whom I worked. At the same time it was important to be open to new ideas, without filtering out knowledge which did not fit the project objectives. Reason warns of the danger of 'when the 'action' in 'action research' tempts us to become hegemonically agentic' (Reason, 2003).

Combining these different cycles of action and reflection enabled the development of evidence and policy with a wide range of internal stakeholders through different contexts. The approach was also flexible enough to respond to their needs and own pace in understanding the issues. This pragmatic action research approach was particularly useful in small group interactions, and enabled timely organisation of meetings, and the ability to respond to other opportunities. This enabled me as the worker researcher to build effective and trusting relationships with different participants depending on their needs. Instead, other research techniques, such as interviews and questionnaires would have treated them as homogenous research subjects. Engaging with uncertainty and complexity carries its own risks and personal challenges, particularly for someone more naturally drawn to a more linear model of decision-making. So, I learnt to manage this by attempting to ensure that each dialogue or communication was documented, with quarterly progress reports produced used to track interventions, and regular meetings with my managers to reflect on progress.

Figure 3.6: Research techniques and data collection, analysis and reporting

	Research technique and data collected	By whom	Analysis and reporting
Objective 1: To analyse the relationship between environmental quality and social deprivation	Documentary analysis (September – December 2002). Literature and policy review to provide contextual, political and evidence base of existing knowledge. See section one.	Helen Chalmers	The documents were reviewed and key themes identified in meetings with Social Policy Manager. Results used to inform focus of comprehensive review undertaken by Staffordshire University and Leeds University. Some of this review is presented in section one.
	Interviews and meetings with Environment Agency staff and external stakeholders (October 2002 – March 2003). See section 4.1.2.	Helen Chalmers, John Colvin and Professor Gordon Walker	Participant observation and meetings recorded in learning diary and used to inform research questions, research approach and policy development activities.
	Small group workshop and mind-mapping exercise with Environmental Equality steering group members (March 2003). See section 4.2.2.	Helen Chalmers, John Colvin and Professor Gordon Walker	Workshop discussion and mind maps recorded in report of meeting. Data was used to inform decision to focus on three issues: flooding, air quality and IPC sites; and consultants' interpretation of environmental data sets.
	Literature review (December 2002 – February 2003) A more comprehensive and structured review of existing secondary data and research was undertaken focusing on eight of the Environment Agency's corporate environmental priorities, including air quality, potable water quality, point source emissions and wastes, flood hazard, and recreational water quality. A gap analysis was undertaken to identify what further analysis was needed to support the development of an Agency policy position on addressing environmental inequalities. See section 4.2.1 and Annex 3.	Staffordshire & Leeds Universities	A summary of this review is presented in Annex 3 and is available in more detail in Walker et al (2003c). The review informed the Steering Group's view of the value of further quantitative analysis; which issues required further analysis; and appropriate methodologies and techniques for understanding the relationships.
	Rapid review of evidence (September 2002 – September 2004) I reviewed a range of research sponsored by the Agency relating to the social and health impacts of flooding to support our meetings with the Flood Risk Policy and Science Manager on taking forward flood risk and social science.	Helen Chalmers	Relevant evidence reviewed and recorded. Used to inform specific policy inquiries posed by external consultations, or to support inquiries by my functional colleagues.
	Focus group discussion (July 2003) at internal Environmental Equality workshop to test the quantitative analysis and make sense of the relationships. See section 4.2.5.	Helen Chalmers, John Colvin and Pam Gilder	Group discussion and mind-mapping exercises were recorded in a report of the meeting. Results were analysed for patterns and key themes. They were then used to priorities for the project in policy development, and subsequent work with the Environment Agency's policy leads on flood risk management, air quality and process industry regulation.

	Quantitative data analysis (April – June 2003) of relationship between multiple deprivation and flooding, poor air quality and the location of Integrated Pollution Control sites. See section 4.2.3.	Staffordshire & Leeds Universities	Analysis of environmental data sets and their correlation with the Index of Multiple Deprivation (DETR, 2000). Results interpreted and reported by consultants (Walker et al, 2003a). Results were then used to inform whole group discussion with Environment Agency staff (see below), and subsequent policy analyses.
Objective 2: To critically review the Environment	Focus group discussion (July 2003) at internal Environmental Equality workshop to understand the views of Environment Agency staff of the organisation's role, how it should support others, and what the Agency should advocate to others. See section 4.2.5.	Helen Chalmers, John Colvin and Pam Gilder	Group discussion was recorded in a report of the meeting. Results were analysed for patterns and key themes and used to inform a 'framework for action' presented to the Environment Agency's Directors in December 2003.
	Series of small group discussions (July 2003 – March 2004) with relevant policy leads to reflect on results from internal workshop. See section 4.3.4.	Helen Chalmers with policy advisors	Discussions recorded in learning diary and key themes identified. These results were then used to inform subsequent discussions and policy development.
	One-to-one, face to face dialogue, via email and telephone (July 2003 – March 2004) with functional colleagues to agree Environment Agency's role in responding to particular inquiries. For example in response to an inquiry from the public about the impacts of air pollution in Greater Manchester. See section 4.3.4.	Helen Chalmers and John Colvin	Discussions recorded in learning diary and key themes identified. These results were then used to inform subsequent discussions and policy development.
Objective 3: To develop the Environment Agency's policy position on addressing	Third-person inquiries (various) with staff across the Environment Agency about how to position the organisation's response to external consultations and the solutions which should be advocated. For example, the formulation of the Agency's response to the ODPM's consultation on which indicators of environmental deprivation should be included in the revised English Indices of Multiple Deprivation. See section 4.4.1.	Helen Chalmers with Environment Agency staff	Comments recorded electronically and analysed to identify key themes. These were used to inform the Agency's response to formal external consultations.
	One to one conversations (monthly/ frequent) between my manager and I to check and reflect on, for example our observations about how our actions had effected change within the organisation, and to plan our next steps.	Helen Chalmers John Colvin	Discussions were recorded in learning diary and used to identify priorities for policy development activities.
	Meetings and workshops with external stakeholders (July 2003 – September 2004) organised around specific questions according to their purpose. For example, project board meetings with the NRU to develop their Environmental Exclusion Review.	Helen Chalmers	Participant observation and discussion recorded and used to inform policy position.
	A learning diary (September 2002 and September 2004) was used to record my activities and reflections as both as a worker-research and as a participant in the research process.	Helen Chalmers	These diary entries were analysed and used to record qualitative data, such as discussions and interviews. These provided a rich picture of the interactions during the research process, participants and subjects.

3.5.2 Quantitative analysis

Informed by the decision-making process described above, quantitative analysis was undertaken to analyse the relationship between environmental quality and social deprivation. This used the government's Index of Multiple Deprivation (DETR, 2000) and data on three high priority issues: flooding, air quality and Integrated Pollution Control sites in England and Wales.

For each issue, census wards were used and ranked according to their relative deprivation. These were calculated using the six separate domains (income, employment, health deprivation and disability, education, skills and training, housing and geographical access to services), and the thirty three separate indicators within these domains. These ranked wards were then placed into ten deciles containing equal numbers of population (using mid-1998 population estimates from Neighbourhood Statistics at the Office of National Statistics).

Understanding the causality of these relationships was beyond the scope of this study and would have required sophisticated modelling using a regression method. Instead, the data was analysed using simple statistical measures and indicators of inequality, using the Gini Concentration Index (CI). The CI is closely related to the simpler Gini co-efficient which has been widely used as an indicator of income and health inequalities.

(i) Flood hazard

The proximity of populations to flooding from rivers (fluvial) and on the coast (tidal) was analysed by using the Agency's Indicative Floodplain Maps (IFM). These maps show 1 in 100 year peak water level return periods for rivers and 1 in 200 year floods for coasts or the highest known water level. While, these were the best available national floodplain maps for England and Wales, they were limited as indicators of flood hazard or risk because they take no account of flood defences and therefore the level of protection provided for to different areas and populations.

(ii) Integrated Pollution Control (IPC) sites

The analysis of IPC sites used a variety of methods to analyse:

- the spatial distribution of IPC sites, using two methods: 'spatial co-incidence', which counts the number of sites with grid references falling within different wards;
- the number of people living with a distance of 500m and 1km of an IPC sites by population weighted ward deciles, using a 'population proximity' method, which uses a buffer distance around each site to characterise the location of each site
- the numbers of people living with 1km of multiple IPC sites;
- the number of authorised processes and emission sources at each site;
- the number of IPC sites differentiated by their sector (ie chemical, fuel, metal, mineral, waste, or other);
- sites producing emissions to air and for levels of key air pollutants (eg nitrogen dioxide and particulates);
- the operator performance of the sites using the Environment Agency's Operator and Pollution Risk Appraisal (OPRA) scores;
- the pollution hazard or level of 'local annoyance' indicated by a Pollution Hazard Appraisal score of offensive characteristics.

(iii) Air quality

The social distribution of five National Air Quality Strategy (NAQS) (DETR, 2000b) pollutants were analysed: nitrogen dioxide (NO₂), fine particulates (PM₁₀), sulphur dioxide (SO₂), carbon monoxide (CO), and benzene. For each pollutant the following were examined:

- the ward annual mean air quality;
- ward mean exceedences of NAQS standards;
- the distribution of wards with the poorest air quality, irrespective of standards.

In addition, we analysed the predicted levels of NO₂ and PM₁₀ in 2015 to assess how the expected changes in concentration differentially affect more or less deprived areas.

Annex 3 provides a more detailed discussion about the methodological techniques and complexities involved in equity analyses, such as data quality and availability;

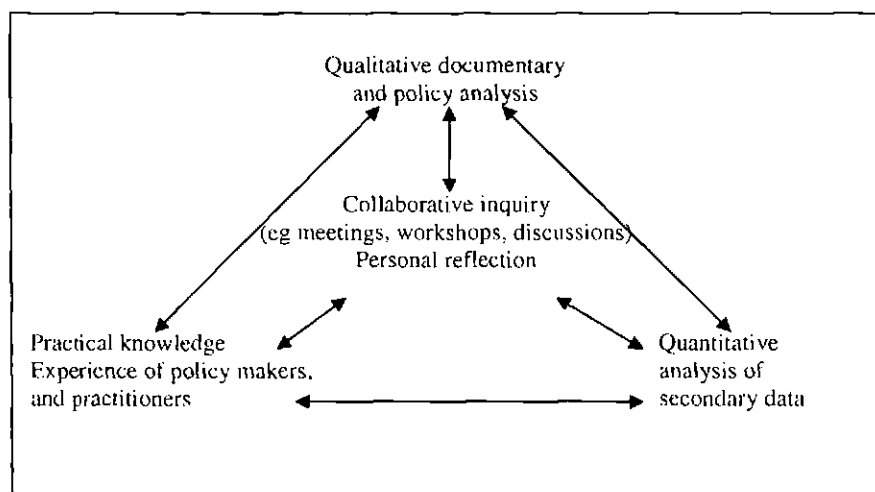
statistical assessment of inequality and understanding causality (Walker et al, 2003b).

3.5.3 Triangulation

The questions posed by the three objectives were addressed by triangulating the data gathered using these techniques. This was done to ensure that different ways of constructing knowledge informed the project findings. As Fine et al highlight in their essay on using research for the sake of social justice, it is important to draw on a range of different methods in order to triangulate the findings and reveal different perspectives (Fine et al, 2000).

The processes outlined earlier, such as workshops, and small group inquiries were used to triangulate the findings and different perspectives, by testing and cross-checking. Figure 3.7 below shows how these different sources of data were triangulated.

Figure 3.7: Triangulation of research techniques



3.6 Ensuring the feasibility of the project

3.6.1 Time

This project was made feasible by ensuring that it was managed by a dedicated Policy Development Officer over a period of two-years. Below is a summary of the

proposed work-plan submitted to the Environment Agency's research and development Project Approval Board.

	Oct-Dec 2002	Jan-Mar 2003	Apr-Jun 2003	Jul-Sep 2003	Oct-Dec 2003	Jan-Mar 2004	Apr-Jun 2004	Jul-Sep 2004
Objective 1								
Objective 2								
Objective 3								

3.6.2 Funding

The project was funded by the Sustainable Development Unit's Research & Development budget. Including the researcher's salary, expenses and consultant's fees, the project cost approximately £120,000.

The next section will illustrate how the various techniques were employed throughout the action research cycle of this project, in order to deliver the project's objectives. I will then return to questions of methodology in the concluding section to evaluate the strengths and weaknesses of this approach, and the research and development process employed.

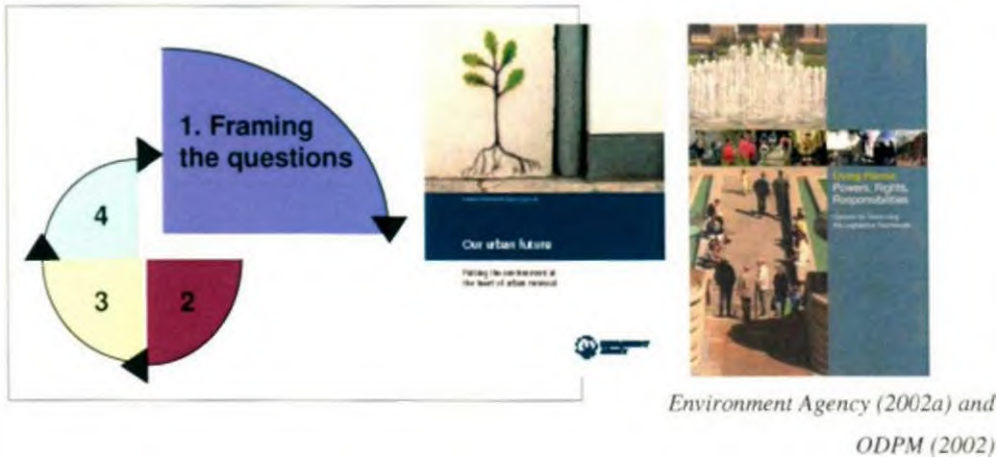
4. PROJECT ACTIVITY AND FINDINGS

This section summarises the key stages of the research inquiry and policy development process, by examining the choices that were made, and their findings. The process involved cycles of framing questions, gathering evidence, then making sense of this evidence with others, before seeking policy commitments from the Environment Agency and those I sought to influence. Lastly, a fifth stage involved evaluating progress, in order to identify and frame the questions for subsequent cycles of inquiries. These stages broadly reflect those identified by McNiff: ask questions, collect data, analyse, form hypothesis, plan action steps, positive action for change (see figure 3.4). These stages are shown in figure 4.1. Pictures of relevant documents are used throughout the following sections to illustrate examples of the project activities and the outcomes produced during each stage of the action research cycle.

Figure 4.1: Action research cycle for developing the Environment Agency’s policy position on addressing environmental inequalities



4.1 Stage 1: Framing the questions and building support for the project (July 2002 – March 2003)



The most substantial phase of the research was in the initial stages of understanding what was needed from this two-year work based project. This first planning stage of the action research cycle was vital if a case was to be built and support gained for the project. This was also necessary if I was going to be able to frame the research questions in a way that represented the needs and expectations of those I sought to collaborate with and influence.

4.1.1 Securing my position as the worker-researcher

The opportunity to progress from my position as Sustainable Development Officer to undertaking the DProf was a condition of my employment at the Environment Agency. But it was my involvement in the Social Policy Joining Up project through co-ordination of the Local Strategic Partnerships Pathfinder project⁵ that gave me a basic understanding of the Environment Agency's engagement in deprived areas, and made my transition to the Social Policy Team tenable. My personal motivations for pursuing this project were influenced strongly by my values, belief in equality and that an organisation that claimed to champion the environment 'in the context of sustainable development' had a moral obligation to strive to deliver environmental

⁵ The LSP Pathfinder Project contributes to the achievement of the Agency's corporate target five: "To contribute to all Local Strategic Partnerships, focusing effort on the 50% where we can most benefit social and environmental capital, including disadvantaged communities and ethnic minorities".

improvements for everyone. These motivations were discussed at an early stage of the project with the Social Policy Manager.

4.1.2 Understanding the needs of this project

These early discussions proved invaluable in building up a rich history of the organisation's engagement with environmental equality as a policy construct (see section 1.4)⁶. The Social Policy Manager had initiated much of the Environment Agency's work in this area, and held the organisational memory about the external pressures, the internal drivers and some of the views of the Environment Agency's staff and management on these issues. This knowledge was vital in building a business case, and in securing funding from the Environment Agency's science programme for my post and the project. Many of the drivers identified in section one of this report were used to justify our successful application for science funding:

- the Environment Agency's statutory responsibilities for taking account of social considerations;
- the Environment Agency's commitment to be 'more aware ... of the needs of people in poverty who often live in the most polluted environments' (Environment Agency, 2000a);
- the need to respond to its commitments to contribute to achieving environmental equality at its AGM in 2000;
- the Directors' request for further research on social deprivation and environmental quality, with particular reference to the Environment Agency's regulatory responsibilities;
- the draft Science Strategy priorities, which included 'understanding how environmental, social and economic impacts interact' (Environment Agency, 2002c);
- the timeliness of the project in contributing to the emerging political agenda around social exclusion, environmental justice and joined up public administration.

⁶ Meeting between Social Policy Manager, Policy Development Officer and the worker-researcher, 1 July 2002 to plan the next steps following feedback from Directors on a paper to Policy Steering Group in June 2002.

After securing funding for this project, I was able to promote the issues of environmental equity and was increasingly seen as the main point of contact for these issues within the organisation. These issues were then increasingly stated as a key priority for Social Policy, Policy Development & Promotion and Environmental Policy. Further legitimacy for this work was provided much later in July 2003, with the agreement of the organisation's social policy, which prioritised 'addressing environmental inequalities' as its second principle:

'Addressing environmental inequalities: While 'combating poverty and social exclusion' (one of the guiding principles of the UK sustainable development strategy) is not a primary responsibility of the Agency, the Agency does have a contribution to make in tackling environmental inequalities. At the very least, the Agency should be able to demonstrate that we have considered any potential negative social impacts of our work and clarified our responsibilities for mitigating these.' (Environment Agency Social Policy, 2003c).

Subsequent meetings with other staff and stakeholders also enabled me to explore other drivers and needs for research, as well as potential synergies with other projects. These included discussions with:

- the Social Policy Manager during monthly one to one meetings;
- the Social Policy Team (SPT) during monthly team meetings;
- the Social Science group (consisting of members of the SPT and the Economics Team);
- the Head of Environmental Policy;
- Area, Regional and Policy staff at the Joining Up Project Development Group (PDG);
- the Environmental Monitoring & Assessment Team, who had conducted the Agency's previous analysis of deprivation and environmental data sets;
- the National Diversity Manager;
- the newly formed Human Health Team – who manage science on the health impacts of pollution;
- the Neighbourhood Renewal Unit, Office of the Deputy Prime Minister;

- Social Policy Advisor, English Nature about the social aspects of, and access to nature;
- the Director of Capacity Global and UK Sustainable Development Commissioner, who had developed much of the pioneering work on environmental justice in the UK;
- the Sustainable Development Unit, Scottish Environmental Protection Agency (SEPA).

External workshops also gave me opportunities to explore current research needs with a variety of stakeholders. For example, a workshop organised by the Environmental Justice Network and Sustainable Development Commission in December 2002 explored the implications of environmental justice for the different organisations, and identified a number of priorities for progressing environmental justice in the UK, including:

- mapping of environmental 'bads' (eg sources of pollution) by the Environment Agency;
- further research on the links between the environment and human health;
- a comparative analysis of different approaches for tackling environmental injustice;
- evidence-based policy;
- processes which linked national policy to local action, and bring together different stakeholders;
- better links between Defra's work in promoting procedural justice through the Aarhus Convention and substantive aspects of environmental justice.

The workshop also provided an opportunity to establish myself as the Environment Agency's contact on social deprivation and environmental justice, and enabled me to meet key government officials, NGO leaders, and campaigners who have proved critical in developing this project.

4.1.3 Framing the questions

Despite clear agreement for further research, the background to this work in the Environment Agency had revealed a more complex picture about the political acceptability of developing this as an area of policy. The Environment Agency's *Environmental Vision* and the direction provided by the Chief Executive meant that there was a renewed commitment to focusing on environmental outcomes. But while the new management clearly supported the organisation's role in contributing to wider sustainable development aims, there were strong concerns that in strengthening its contribution to achieving social goals, the Environment Agency would stray beyond its statutory remit. Indeed, during one interview, an Environment Agency Board member argued vociferously that "tackling social deprivation was not the Agency's job". As a result I increasingly emphasised how this project would investigate the inequality of environmental outcomes, rather than promote any focus on social deprivation.

The Environment Agency's earlier analysis of environmental issues and social deprivation had been commissioned partly to test the validity of research by others, such as Friends of the Earth, which had implied that the Environment Agency was complicit in the siting of IPC sites next to deprived communities. Naturally, as this brought into question the organisation's approach in its delivery of environmental protection, any work in this area seemed to prompt concerns about the corporate and reputational risks of engaging with this controversial agenda. For example, in response to a paper in June 2002, which posed the questions 'how can the Agency ensure that its activities do not contribute to perpetuating social deprivation? What part, if any, should the Agency play in alleviating deprivation?', one Director said that "the Agency cannot take social impact into account when regulating through IPC". The Directors also questioned whether the correlations between IPC sites and social deprivation warranted particular attention. For example one Director commented that "living next to a well-regulated site shouldn't be a problem" – referring to the Environment Agency's regulation of industrial pollution against health-based environmental standards, but not acknowledging wider social impacts (Policy Steering Group, 2002).

The poor air quality found to be concentrated in deprived areas is primarily caused by emissions from transport, and sources for which the Environment Agency had no regulatory responsibility. So the Directors pointed to the responsibility of the planning system and its role in authorising applications for new developments and transport infrastructure in urban deprived areas. At this time, the Environment Agency was developing its response to the government's urban regeneration agenda. For this reason the Directors recommended that further work relating to social deprivation should focus on developing the Environment Agency's core messages for the launch of the '*Our Urban Future*' report and the Urban Summit 2002⁷.

Consequently, I often made connections between the project and the opportunities for strengthening the government's approach to neighbourhood renewal. In our opening presentations at the Environmental Equality Steering Group in April 2003, the Head of Environmental Policy and I highlighted the government's policy and programmes for tackling multiple deprivation and urban renewal as a key driver for the project, alongside the commitments in the 1999 UK Sustainable Development Strategy, which was due to be reviewed in 2004 (see Annex 2). Pre-meeting registration forms, which asked participants to describe their 'personal or organisational role in relation to environmental equality' were designed to help make links between the subject matter and their work. For example, there were clear connections between the project and the Office of the Deputy Prime Minister's plans to explore the issues of environmental exclusion, set out in its '*Living Places*' strategy (ODPM, 2002:58) and commitment to ensure that neighbourhood renewal helped deliver environmental equity (ODPM, 2003).

The involvement of the Environment Agency's Sponsorship Division within Defra also helped to reinforce the value of the Environment Agency undertaking research in this area, and demonstrate their support to those policy managers who may have been uncertain of its legitimacy. One Defra official suggested that "[promoting environmental equality] would add value by integrating sustainable development into regulation", while another enthused that "[by championing this issue, the

⁷ The Urban Summit was held on 31 October and 1 November 2002, two years after the publication of the government's White Paper 'Our towns and cities; the future. Delivering an Urban Renaissance' to take stock of progress with urban policies and programmes.

Environment Agency] would provide the exemplar for other government departments" (in Chalmers, 2003a). Amongst these strong advocates for environmental justice, participants from the Environment Agency appeared openly supportive, with one policy manager pledging to "do what I can to facilitate the internal process and build support for this work amongst the Agency's functions".

4.1.4 Shaping external drivers to influence the Environment Agency

I also helped to actively shape the external reference points that would provide useful drivers for the project, and would help demonstrate its importance to those within and outside the Agency. An early opportunity came in February 2002 with the Prime Minister's annual speech about the environment. Due in part to his former role as special advisor to the Environment Minister, and the Environment Agency's existing work in this area, the Head of Environmental Policy was asked by government advisors to provide information about environmental inequalities for inclusion in Prime Minister Tony Blair's speech. I collated a quick review of the literature and key issues for his brief for Defra officials.

While tackling climate change was without doubt the strongest message delivered in the speech on 24 February 2002, the Prime Minister also spoke of the links between poverty and environmental degradation and the need for joint action to tackle these. There were strong references made to graffiti and litter, but also to issues of concern to the Environment Agency, such as waste and emissions from traffic:

"It is the poorest that live in the worst housing, and are the most affected by traffic pollution, live closest to landfill sites and have the worst graffiti and litter problems...By raising the standards of our local environments overall, we have the greatest impact on the poorest areas" (Blair, February 2003).

The Social Policy Manager and I saw this as an indication of the high level of political interest in environmental inequalities, and a chance to highlight the work being undertaken by the Social Policy Team in response to this growing agenda. In a briefing circulated to the Environment Agency's Chairman, Chief Executive and

Directors, we highlighted our developing research on environmental inequality. The briefing, presented in Annex I also explained how we were helping to address some of the challenge set by the Prime Minister through: appraising the social aspects of the Environment Agency environmental work; helping local staff prioritise their work with Local Strategic Partnerships in deprived areas; and in shaping the government's proposals for housing growth in the South East and tackling housing decline in other parts of the UK. Although there was no immediate response from its recipients, this briefing provided the first step in raising the profile of this project within the Environment Agency.

Coincidentally, on the same day as the Prime Minister's speech, the Environment Agency's Chairman attended a debate on 'risk and inequality'. The speakers included Professor Gordon Walker, whom I had recently contracted to undertake analysis for the Environment Agency on environmental inequalities, and who presented the current evidence and policy options for tackling the distribution of environmental risks. The event provided an opportunity for myself and the Head of Risk and Forecasting to brief the Chairman on the challenges that managing growing inequalities and societal pressures to address these issues⁸. At the debate the Chairman made connections between the emerging evidence of environmental inequalities, and the Environment Agency's approach to risk management and stakeholder engagement.

This stage and early exploration of the issues with a variety of stakeholders helped clarify the research questions and the activities that the project needed to undertake in subsequent stages. There were calls from a wide range of stakeholders for a better understanding of the links between environmental quality and social deprivation. But where correlations had already been established, questions remained about the location of regulated environmental hazards and their health and wider social impacts. While those outside the organisation could see a clear role for the Environment Agency in this debate, the organisation's senior management were clearly concerned about the extent to which it could affect change and the implications for its operations. On the other hand, they were evidently interested in

⁸ Hazards Forum Evening Event – Risk & Inequality, 2 February 2003, London.

the role that wider organisations could play, and how others' strategies could help addressing any environmental inequalities. My manager and I therefore decided that the project should focus on three objectives:

- (i) to analyse the relationship between environmental quality and social deprivation;
- (ii) to critically review the Environment Agency's role in addressing environmental inequalities; and
- (iii) to develop the Environment Agency's policy position on environmental inequalities (specifically, what is the role of the Agency, and what do we expect from others).

4.2 Stage 2: Gathering the evidence (April 2003 – July 2003)

By teasing out these questions, stage one also helped establish, with stakeholders from within and outside the organisation that further inquiry into environmental inequalities was worthwhile. Thus stage two of the action research process, which involved collecting data and identifying the problem was able to build on this support and involve a wide variety of stakeholders, drawing on their experiences, knowledge and different perspectives.



4.2.1 Reviewing the evidence base

To learn from the existing research and evidence on the relationships between environmental quality and social deprivation, the Project Board commissioned

consultants from Staffordshire University and Leeds University to undertake a literature review and identify the gaps which restricted the development of Environment Agency policy. The review (summarised in Annex 3) found a weak and limited research base in the UK, which is primarily concerned with air pollution, point source emissions and wastes, and major accident hazards, but from which it is difficult to draw any firm conclusions. Most of the studies had used simplistic proximity analyses and made no attempt to establish the causal mechanisms for environmental inequalities, or to evaluate (through a justice framework) whether the observed inequalities are fair or acceptable (Walker et al. 2003c). In the case of air quality however, the balance of evidence seemed to suggest that deprived communities bear an above average cost of poor air quality.

4.2.2 Mapping the practical knowledge of the Steering Group

To complement and validate this empirical review, as well as steer the following processes for gathering and analysing evidence, I brought together a steering group including Environment Agency and government policy makers, researchers and NGOs (see section 3.4.1). Mind mapping exercises and facilitated workshops were used to draw on the steering group's practical knowledge about the nature of the relationships between environmental equality and social deprivation. Figure 4.2 shows an example of how I and the other facilitators at the workshop mapped the participants' knowledge.

As the report of the first meeting (presented in Annex 2) documents, the discussions illuminated some of the historical, social and political factors that affect the location of industrial processes next to residential areas, and which have since become areas of social and economic deprivation. The experience of the workshop participants also revealed that there might be difficulties in understanding the impacts of environmental hazards on people's psychological and wider health, as well as the capacity of communities to cope. In particular, it was clear that current knowledge about the nature of environmental inequalities may be constrained by the data collected by organisations such as the Environment Agency, where these data represent the values and responsibilities of these organisations, rather than the issues of importance to communities (Chalmers, 2003a).



As one participant explained, those organisations responsible for collecting local data, such as local authorities "don't tend to ask the [subjective] questions, like what percentage of people feel satisfied with their local environment". Several participants suggested that a lack of data and research should not preclude action from the Environment Agency on tackling environmental inequalities, and that it should adopt the precautionary approach despite uncertainty and incomplete knowledge. The majority of participants agreed that there was considerable value in undertaking further research, not only to address the current knowledge gaps, but also to help better inform policy and practice.

4.2.3 Analysing environmental data sets

To decide where the Environment Agency should focus the next step of the research process, the consultants categorised a wide range of environmental issues as high, medium or low priority for further research, with high priorities identified where:

- a) the issue was of significance to environmental equity and deprived communities;
- b) the issue was relevant to the Environment Agency's corporate objectives; and
- c) there was 'good' availability and quality of data (see figure 4.3).

When asked to identify criteria on which to prioritise future research, the steering group felt strongly that the project should look at the 'bigger picture' and seek to examine the complex relationships between the impacts of cumulative environmental hazards on deprived communities. These desires highlighted a tension between these broader ambitions, and the pragmatism needed to manage the project, and Environment Agency staff who preferred to focus on specific areas of policy. For example, the steering group's chair stressed the need to focus on issues relating to the Environment Agency's regulatory activities "so [the Agency's] staff would feel confident that we can act on this research and will be able to make a difference" (Chalmers, 2003a).

Participants suggested that the research should also consider 'access to environmental goods' such as green space. However, these were considered beyond the Environment Agency's remit and the scope of this project. Instead, the Project Board directed the consultants to focus on a small number of issues that were

relevant to current and forthcoming political drivers and new duties, such as the Water Framework Directive 2000/60/EC (WFD) and review of the government's strategy for flood risk management.

Figure 4.3: High priority environmental issues for further equity analyses

Environmental topic	Comment on categorisation
Air quality standards (NAQS standards exceedences - variables selected on basis of frequency of exceedence)	Very significant with respect to legal obligations (e.g. EU standards, Aarhus) and to health; Extend analysis to further variables considering both annual mean and peak standards.
Air quality (Concentration of NAQS pollutants - to be selected)	Health concerns remain below standard level; Extend analysis to further variables (to be confirmed from CO, PM ₁₀ , PM _{2.5} , SO ₂) with known health implications. (see COMEAP).
Potable water quality standards % compliance failure (all and/or parameter specific)	Most significant water variable given direct health impact, but more relevant to remit of DWI than EA. Data holdings require investigation.
Flood Hazard	Significant with respect to vulnerability and health, and also the EA remit; May be appropriate to address equity for different flood return periods.
Proximity to polluting sites (Including IPC sites and waste incinerators)	Some existing UK analysis, but should be extended to consider greater range of site characteristics (e.g. size, type, buffer area) to improve assessment of risk
Proximity to major accident hazard sites	Some existing UK analysis, but should be extended to cover deprivation, consider greater range of site characteristics (e.g. size, type, buffer area) to improve assessment of risk. Remit of HSE not EA
Pollution incidents	Relevant re health and vulnerability; Good data availability with no known UK analysis to date.
EA permits : prosecutions, cautions and compliance	Significant in terms of EA enforcing compliance equitably. Requires careful analysis (e.g. comparison of like permits and facilities). May be affected by company factors external to EA.
Facility inspection rates	Significant in terms of EA policing polluters equitably. Requires careful analysis (e.g. comparison of like permits and facilities). Should be independent of external EA factors.
<i>Source: Walker, G., Mitchell, G., Fairburn, J. and Smith, G. (2003c). <u>Environmental Quality and Social Deprivation. Phase I: A Review of Research and Analytical Methods</u>. Research and Development Project Record 12615, Bristol: Environment Agency, pp.111.</i>	

Flooding is known to pose significant risks to already vulnerable people, such as the elderly and single-parent families; and raises issues for the Environment Agency as the competent authority in ensuring the equal and consistent treatment of communities at risk (Warhurton et al, 2005). Having considered the views of the steering group and taken into account the wider political drivers, the Head of Environmental Policy, the Social Policy Manager, the consultants and I also decided that the analysis should focus on IPC sites. Here we felt there was significant scope for considering the characteristics of the sites, and the Environment Agency's

processes for regulating industrial pollution (e.g. through granting permits and enforcing compliance with environmental standards). By contrast, it was agreed that an analysis focusing on air quality would provide an opportunity to explore how the Environment Agency works with in managing an issue where it has less regulatory control. With support from the Project Board and various data specialists within the Environment Agency, I advised the consultants in undertaking the data analysis. The highlights of the quantitative research that followed from this decision are shown in figure 4.4.

Figure 4.4: The relationships between social deprivation and poor air quality, IPC sites and flood hazard.

Deprived communities bear the greatest burden of poor air quality

- In England, the most deprived wards experience the highest concentrations of nitrogen dioxide (NO₂), fine particulates (PM₁₀), sulphur dioxide (SO₂), carbon monoxide (CO), and benzene.
- People in deprived wards are exposed to 41% higher concentrations of NO₂ than those people living in wards of average deprivation.
- Analysis using the air quality index identifies clusters of wards that have poor aggregate air quality and high deprivation; these 'pollution-poverty hotspots' include large clusters in London, Manchester, Sheffield, Nottingham and Liverpool.

IPC sites are disproportionately located in deprived areas in England

- There are five times as many sites and authorisations located in the wards containing the most deprived 10% of the population, and seven times as many emission sources, than in wards with the least deprived 10%.
- In deprived areas, IPC sites are:
 - more clustered together
 - on average produce greater numbers of emissions
 - present a greater pollution hazard
 - produce more 'offensive' pollutants
 - produce higher emissions of PM₁₀ and carcinogens.
- In Wales, patterns are very different. There is only some bias towards deprived areas found when looking at multiple sites, while emission levels showed some bias towards *affluent* areas.

Tidal floodplain populations in England are strongly biased towards deprived communities

- There are eight times more people in the most deprived 10% of the population living in tidal floodplains, than the least deprived 10%.
- In comparison, fluvial floodplain populations are weakly biased towards more affluent communities in England.
- The relationships between flooding and deprivation are less distinct in Wales.

Source: adapted from Walker, G., Mitchell, G., Fairburn, J. and Smith, G. (2003a). Environmental Quality and Social Deprivation. Technical Summary. Research and Development Project Record 12615, Bristol: Environment Agency, pp.2.

A summary of the analysis and results is presented in Annex 3. This research therefore provided both an objective and independent analysis of issues and tool for wider dialogue with stakeholders. However, its limitations, discussed in detail in Walker et al (2003d), created difficulties in progressing the Environment Agency's thinking on environmental inequalities, and integrating it into the organisation's and others' policies.

4.2.4 Testing empirical evidence against experiential knowledge of Environment Agency staff

I had originally planned to reconvene the steering group in July 2003 in order to involve its members fully in examining and making sense of the analysis, and developing appropriate policy responses. However, the group decided at the meeting in April 2003 that the research process should be structured to give the Environment Agency time to consider the results of the analysis and the implications for the organisation's policy and practice. On reflection, this was a valuable decision and afforded the organisation the space and time to absorb and explore the opportunities and challenges that this new area of policy presented. On the other hand, this design limited the formal opportunities for external people to be involved in developing the Environment Agency's policy position, and the overall transparency of the process. I therefore chose to instigate other opportunities for informal discussions with external stakeholders in developing the position statement. These will be discussed in more detail in section 4.3 and 4.4.

The Joining Up project board⁹ and development group¹⁰ were two fora within the Environment Agency which provided valuable critiques of the approach we had adopted and reminders of the issues it raised. In particular, the board highlighted the care needed not to exclude issues of rural deprivation, which they considered to be insufficiently represented by the government's indicators of multiple deprivation; and to avoid local blight by exposing the environmental threats of specific wards already known to be socially and economically deprived. Like the steering group, they also offered considerable support to the idea of investigating environmental

⁹ Joining Up Project Board meeting, 15 May 2003, Environment Agency, Millbank Tower, London.

¹⁰ Joining Up Project Development Group meeting, 22 May 2003, Environment Agency, Millbank Tower, London.

inequalities in their social and economic context. For example they suggested that the project could undertake a local case study in the North West region – the location for some of so-called 'poverty-pollution hotspots' identified in Manchester and Liverpool by Walker et al (2003b).

This suggestion and the interest from the North West Regional Strategic Unit (RSU) prompted me to test this evidence further within the context of the North West. The RSU had already initiated a project with the North West Public Health Observatory to investigate the links between health, deprivation and the environment¹¹. This project, which aims to support and inform strategies aimed at improving the health of the population, has taken a similar approach to the national analysis and is due to report in 2005. At a meeting in February 2004, I was invited to present the results of the national analysis to a group of RSU staff. In this meeting we discussed the difficulties that the Environment Agency faces in improving air quality in areas like Greater Manchester, where '17 per cent of nitrogen dioxide ... is emitted by industry', with the rest originating from non-Environment Agency regulated sources such as transport.

These staff also highlighted the difficulties in influencing planning decisions which determine the location of housing next to industrial sites and roads (Curran, 2004). However, it was suggested that the Environment Agency would still be likely to authorise a permit to pollute if the industrial operator could show that they were operating to Best Available Techniques (BAT), even if the site exacerbated existing poor air quality (e.g. from transport) and caused local pollution emissions to exceed air quality standards. This illustrates the challenges in managing other sources of pollution which are not regulated by the Environment Agency, and the roles of wider authorities in the distribution of poor air quality. This prompted those in the North West to suggest that a case study be undertaken to explore the cumulative impacts of environmental degradation in deprived areas, and the relationships between different actors in addressing it.

¹¹ Linking key statistics on health, deprivation and the environment in the NorthWest region meeting with NorthWest RSU staff, NW Regional Observatory, Liverpool University, 4 October 2002, Richard Fairclough House, Warrington.

The meeting also revealed anecdotal evidence that supported the Environment Agency's earlier analysis that the poorest water quality is found in the most deprived areas. It found that up to fifty per cent of watercourse are extensively modified, providing less natural habitats for wildlife (Environment Agency, 2002b). Staff suggested that this relationship might be compounded by the implementation of the Water Framework Directive. The most heavily modified and polluted watercourses are traditionally found in old industrial urban, and therefore more deprived areas. It was suggested that the evaluation of economic and environmental costs and benefits of environmental remediation programmes in such an economically deprived area. This may result in a focus on protecting existing areas of good water quality over improving areas of poor water quality, if wider social costs and benefits are not taken into account. Less stringent 'programme of measures' and standards could also be applied in these areas - therefore perpetuating the cycle of degradation. It was agreed that further research was needed to understand these relationships better, and how the Environment Agency's role as 'competent authority' in implementing the WFD, and its role in piloting stakeholder engagement for river basin planning, could be used more effectively to improve water quality in deprived areas.

4.2.5 Cross Environment Agency workshop on environmental equality

To draw from the experience of a wider range of staff within different parts of the organisation, I organised a one-day workshop in July 2003. I invited a cross-section of Environment Agency staff, including policy managers relating to air quality, process industries regulation and flood risk management; data and information managers; external relations officers; regulatory officers; and regional strategic environmental planners covering five of the Environment Agency's regions: the Northwest, Northeast, Wales, Midlands, Southwest and Thames. The workshop was designed to interrogate the findings of the analysis and further understand the relationships between environmental quality and social deprivation. Annex 4, which provides a full record of this workshop details the participant's analysis of the evidence; their reflections on which policies, processes and practices affect environmental inequalities; and the actions they considered would make the greatest difference (Chalmers, 2003h). These are summarised below and in section 4.3.1.

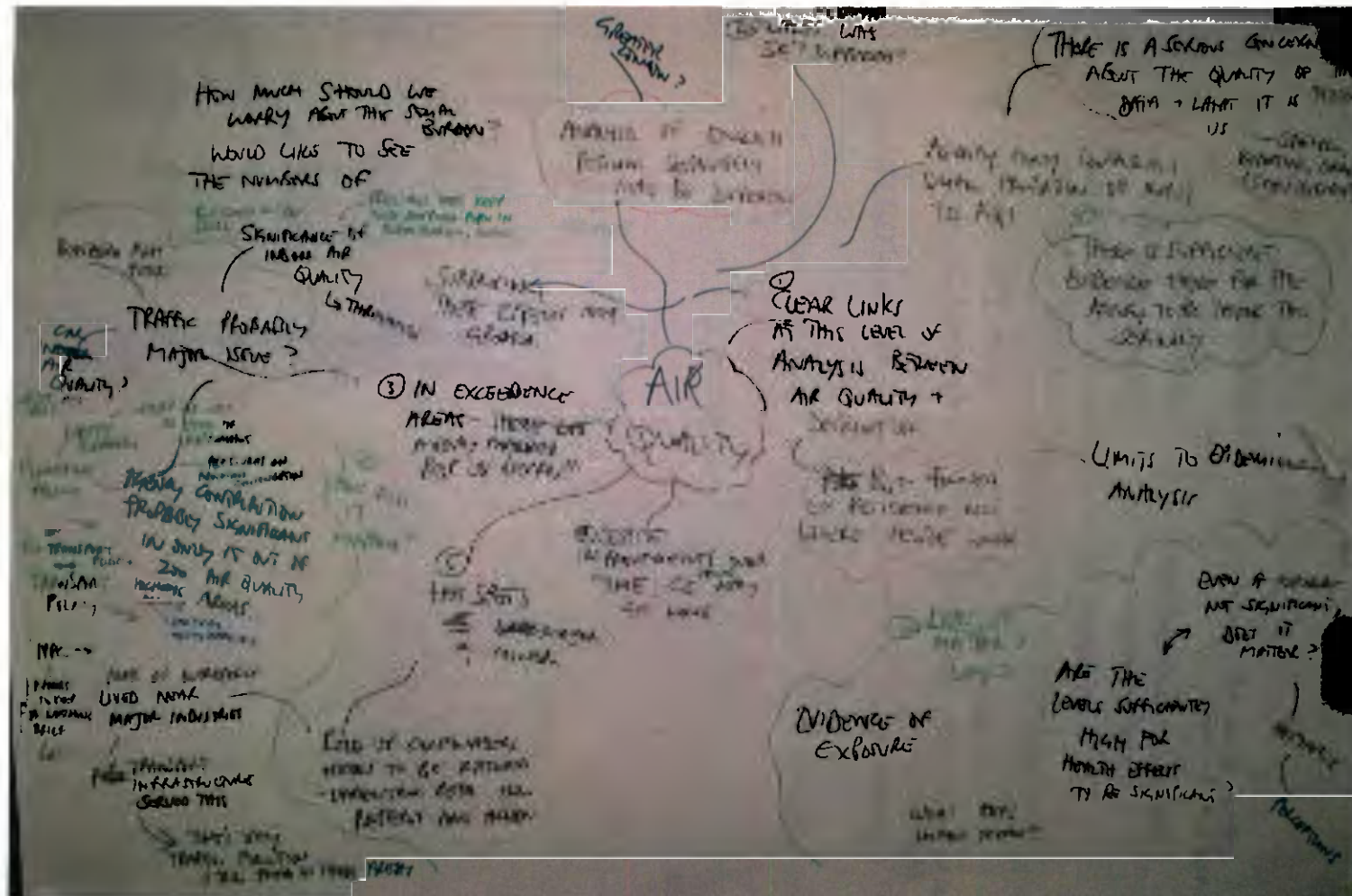
Most notably, the workshop revealed, as interviews with the Heads of Functions (whilst developing the social appraisal tool) had done, that 'questions of social justice, equality and improving local communities are not abstract theoretical puzzles to Environment Agency staff, but daily practical dilemmas as they attempt to reconcile competing demands, and try to work consistently and to common standards' (Warhurton, Wilkinson, Christie, Orr, Colvin and Chalmers, 2005).

Figure 4.5: Small group discussion on the social distribution of IPC sites



By working in small groups, the workshop participants identified policies, processes and practices which affect inequalities in the distribution of flooding, poor air quality and IPC sites (for example, see figure 4.6). A major factor influencing the location of IPC sites and transport infrastructure is known to be the historical location of industrial development close to poor quality housing inhabited by predominantly more deprived social groups. In addition, subsequent land use planning (and zoning by local authorities) is thought to act to protect good quality environments by locating new industrial sites in areas that are already degraded; and often to direct new sources of this type of employment in low-income and deprived areas, sometimes as part of urban regeneration initiatives.

Figure 4.6: The relationships between air quality and social deprivation, and the policies, process and practices that affect these environmental inequalities: mind map, July 2003.



Participants also highlighted that many breaches of air quality standards are caused by activities that are not regulated by the Environment Agency, and that IPC sites probably contribute a small proportion of air quality exceedences. For instance, seventy five per cent of air pollution in Port Talbot reportedly comes from non-Environment Agency regulated sources. Traffic and congestion are thought to provide one of the most significant sources of air pollution, and these are managed by other actors such as the Highways Agency, regional and European policy.

Similarly, the local authority planning process influences where new waste management facilities (e.g. incinerators or landfills) are located. On the other hand, changes in UK waste management policy are likely to significantly influence the type and size of waste management facilities in the future – directing waste away from landfill sites, and towards recycling and recovery options. The causes of these inequalities identified by the Environment Agency's staff largely reflected those raised by existing geographical and sociological theories which can help explain environmental inequalities (Walker et al, 2003c), see figure 4.7.

Figure 4.7: Geographical and sociological theories for environmental inequality

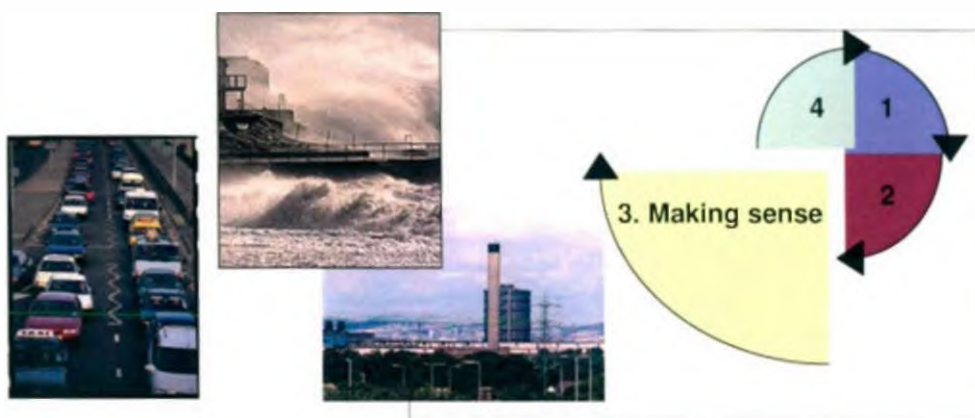
Theory	Characteristics
'Economic' theory	<ul style="list-style-type: none">• Owners of risky facilities site them where collective action against them, or compensation from damages, is least likely to be realised or is minimised.
Location theory	<ul style="list-style-type: none">• Households move to areas that meet a 'package of needs' (Tiebout model). The affluent place a higher value on the quality of the environment, thus the poor tend to occupy areas of lower environmental quality. When environmental decline occurs, the affluent may move away to be replaced by less affluent people who find that the area better meets their package of needs than their previous location.• Industry locates where land, labour and transport costs are minimised. Low income areas are more likely to have cheaper land and provide the appropriate labour force, hence are more likely to house hazardous facilities.
Risk theory	<p>People perceive risk in different ways depending upon personal and social group characteristics:</p> <ul style="list-style-type: none">• Those who value the environment less than average perceive environmental risk as less than average, so will locate closer to the risk than average;• Different cultural groups perceive risk in different ways;• An individuals response to risk is mediated by other attributes which include his/her social group values.

Theory	Characteristics
Neighbourhood change	<p>Neighbourhoods may change via several processes which can put minority groups in closer proximity to hazards:</p> <ul style="list-style-type: none">• Invasion succession: Minorities arrive in a neighbourhood, survive, and make it more attractive for other minorities to move in. Social-spatial transition spills over into area with hazardous facilities;• Neighbourhoods have a life cycle in which ageing and decline occurs naturally, presenting more housing opportunities for people of lower socio-economic status;• Various neighbourhood conditions may act as a pull factor for some people and a push factor for others. An industrial facility may push affluent people away, but attract others to the area for its better housing and employment etc.• Large institutions (e.g. universities) influence the local economy. They may, for example, provide benefits which more than offset the risk due to local undesirable facilities.
Planning and land use change	<p>Land use planning acts to protect good quality environments by directing threats to environmental quality towards areas that are already degraded. Risks and environmental 'bads' are agglomerated and through the operation of the housing market those people with resources to live in higher quality protected environments will do so. Developers select within planning land parcel allocations which areas are to be developed for high quality housing and lower quality 'social' housing, directing lower quality developments into less attractive environments.</p>

Stage two involved gathering empirical and experiential evidence from a range of sources and stakeholders. The literature review and national data analysis established that there are statistical correlations between air quality, the location of IPC sites and tidal flooding – relationships confirmed by the experience of Environment Agency staff and earlier by members of the steering group. Nevertheless, the nature and extent of these relationships differed between the issues (for example between tidal and fluvial flooding) and between England and Wales. Consequently, the causes of these inequalities are varied and complex. The workshop in July had begun to unpack some of these causes, some of which could be explained by an established set of geographical and sociological theories. However, value laden, organisational and political questions still remained about to what extent and how the Environment Agency and others could address these issues. These questions were explored further in stage three.

4.3 Stage 3: Making sense of the evidence and its implications for the Environment Agency and government policy (July 2003 – March 2004)

Stage three of this action research process continued to help us analyse and understand the relationships between social deprivation and air quality, industrial pollution and flooding. But it can also be characterised as a stage of transition between making sense of this evidence and identifying and agreeing the strategic policy changes needed.



Typically, in a positivist research paradigm, the evidence would be evaluated by the researchers and reported with a series of recommendations for subsequent action by policy makers. This would therefore involve two separate processes of sense-making. Drawing on an action research paradigm, the Social Policy Manager and I saw value in early discussions of this evidence with different groups of stakeholders. These discussions were held to gain a variety of understandings and perspectives on the interpretation of the different types of evidence and the implications for the Environment Agency's and government policy.

4.3.1 Exploring the implications of a strategic framework

Critically, the workshop in July 2003 was used to test whether the organisation's staff, and therefore the Environment Agency, care about environmental inequalities, and to what extent the Environment Agency should and could intervene. As Annex 4 details, there were inevitably some concerns about the quality of the evidence, and its value. For example, one participant suggested that "if we want to build trust with local communities, we need to understand communities' experiences and perceptions

of poor environmental quality better" by drawing on other evidence. The participants also highlighted other limitations of the research, in that it did not tell us about the actual levels of exposure, for example from poor air quality, nor about the impacts on communities' health. Moreover it presented a national picture, rather than an indication of disparities between regions. Nevertheless, those present felt that "there is sufficient evidence for the Environment Agency to take environmental inequalities seriously", and, like the steering group, suggested that the Environment Agency adopt a precautionary approach by taking action to tackle environmental inequalities despite the limitations of the research. Overall, there was general agreement amongst the group of the benefits of tackling degraded environments in deprived areas. There was a clear sense from the Environment Agency's staff that the organisation had moral and statutory obligations to promote equality in its role as a public service provider, and be accountable for where it focuses its regulatory action.

The group supported the idea of developing an overall framework for addressing environmental inequalities. However, the discussions revealed significant tensions between the organisation's preoccupation with consistency (for example in applying emission standards across England and Wales) and the potential need to adopt different approaches or standards in different areas, or by targeting particular areas. Although this latter approach, which is used by the government to tackle health inequalities and target neighbourhood renewal was considered contrary to providing equality of service, it was suggested that it might support the Environment Agency's role in targeting action to improve areas of poor environmental quality.

Participants thought that while current environmental standards (for example those applied to permits for IPC sites) are expected to protect human health, they may provide insufficient protection for deprived communities and particular social groups who may be more vulnerable to the effects of pollution. It was therefore felt by some that health impact assessments (HIA) used to inform new IPPC applications¹² should be improved to provide a better assessment of the health risks to these groups

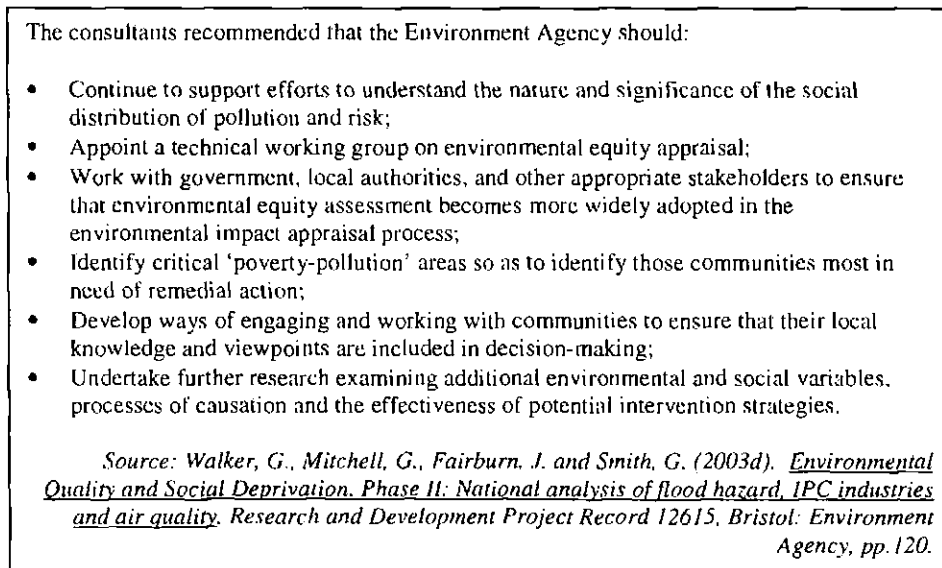
¹² Integrated Pollution Prevention and Control (IPPC) is applied under the IPPC Directive to industrial processes, implemented in the UK by the Pollution Prevention and Control Regulations enforced by the Environment Agency and local authorities.

and the equity implications of decisions. However, the lack of data about the relative exposure and health impacts of environmental quality was thought to be a substantial barrier in adopting this approach.

4.3.2 Identifying opportunities and priorities for addressing environmental inequalities

The final report by Staffordshire and Leeds Universities presented detailed recommendations in relation to air quality, IPC sites and flooding, as well as a number of strategic priorities. The recommendations presented in Annex 3 are summarised in figure 4.8 (Walker et al, 2003d).

Figure 4.8: Recommendations by the consultant team



Environment Agency staff at the workshop in July 2003 were presented with these recommendations and then asked to identify where they perceived opportunities for addressing environmental inequalities:

- a) through the Environment Agency's policies, processes and practices;
- b) by supporting the work of others to promote environmental equality;
- c) by advocating ways in which others could address environmental inequalities.

For a full account of the opportunities identified, see Annex 4. In order to develop a realistic action plan the Head of Policy Development & Promotion asked the group to identify three things under each heading that would make the most difference to promoting environmental equality; these are shown in figure 4.9.

Figure 4.9: Priorities for environmental equality

<p>a) Changing the Environment Agency's policies, processes and practices by:</p> <ul style="list-style-type: none">• Integrating equity into the policy development process;• Focusing our influence on Defra, the Treasury, the NRU and other partners• Developing locally-refined analysis which looks at the complexity between environmental impacts and health• Providing better information on existing and new sources of risk to environmental quality (for instance for new IPPC-regulated sites);• Improving the Agency's engagement and communication with deprived communities (eg through staff training). <p>h) The Environment Agency supporting others' work to promote environmental equality by:</p> <ul style="list-style-type: none">• Reinforcing the importance of equity to local authorities (particularly in relation to Air Quality Management Strategies);• Influencing and utilising funding streams: Regional Development Agency's funding and EU funding;• Supporting local authorities (and our LSP partners) in developing a joined-up perspective through the development of Community Strategies and Local Strategic Partnerships. <p>c) The Environment Agency advocating solutions to others such as:</p> <ul style="list-style-type: none">• Changing the current appraisal criteria [uses cost-benefit analysis] for investing in flood defence, so that it takes into account social costs (government and Agency policies);• Integrating environmental equity into evaluation processes for policies, projects and funding (e.g. EU funding targets);• Integrating equity into local planning applications through risk assessments (e.g. by targeting local authorities and the Local Government Association). <p><i>Source: Chalmers, H. (2003b). <u>Environmental Equality Research, Policy and Action. Report on the Environment Agency Environmental Equality Workshop</u>, Aston Business School, Birmingham, 14 July 2003. Bristol: Environment Agency, pp.31 (unpublished).</i></p>

To develop these actions further, it was decided by my managers and I that in developing the next stage of this project my work should focus on how the following priority areas could better reflect the need to address environmental inequalities:

- (i) new and existing strategic decision-making tools which help prioritise policies, assess risk, and allocate the Environment Agency's resources;
- (ii) the Environment Agency's approaches to managing flood risk, air quality and IPC regulation;

- (iii) the government's approach to tackling multiple deprivation, by working with the NRU;
- (iv) the government's approach to sustainable development, by working with Defra on shaping the revised UK Sustainable Development Strategy.

4.3.3 Shaping strategic decision-making tools

Under this stream of work I worked with other members of the Joining Up project to develop a range of strategic decision-making tools aimed at integrating environmental equity and consideration of deprived communities into policy, planning and operational activities.

In 2003, the Environment Agency's Sustainable Development and Risk & Forecasting Teams had responsibility for developing the organisation's procedure for Developing and Managing Policy. As part of this process the Environment Agency is already required by the government to undertake a formal Regulatory Impact Assessment in cases where regulatory and policy changes impact on business, charities or the voluntary sector (Cabinet Office, 2003), and make specific reference to equity and fairness. In addition, the Environment Agency's statutory guidance and contribution to sustainable development requires it to take account of the costs and benefits of its policies to the environment, economy and society. Yet, there had been no guidance to enable staff to interpret 'equity' or 'social impacts'. To support them in promoting 'social progress which recognises the needs of everyone', I worked with the Joining Up project team to develop a social appraisal tool, which asks its users to consider the effects of their policies on:

- the provision, quality and choice of commercially and publicly available goods and services;
- human health, safety and well-being;
- equal opportunities, social justice and the particular needs of urban and rural communities;
- effective public involvement in decision-making and delivery (Warburton, Wilkinson, Christie, Orr, Colvin and Chalmers, 2005).

Other tools are also being developed to assist the Environment Agency in strategic risk assessment, in which I helped to highlight the opportunities for taking account of 'social risks'¹³. Strategic Environmental Assessment (EC Directive 2001/42/EC) has the potential for considering equity and the distribution of environmental, social, health and cumulative impacts on communities in the assessment of plans and programmes (Envolve Consulting, 2003). This was the finding of a workshop that I attended in December 2003, and was used to inform the Environment Agency's guidance for its own staff, and external guidance for other organisations. The guidance now highlights social inequality and environmental justice as key issues for considering populations and human health, and recommends that those undertaking SEAs identify the cumulative impacts of their plans and programmes (according to the principles of sustainable development) (Environment Agency, 2004d).

I also continued to support the pathfinder project about the Environment Agency's engagement with Local Strategic Partnerships (LSP). As co-ordinator of this project, I had helped to develop guidance and a tool which uses multiple deprivation to prioritise the organisation's resources at an operational level (Warburton, Porter, Wilkinson, Colvin, Chalmers, 2005). The 'LSP prioritisation matrix' is designed to help Partnerships Officers and Area Management Teams decide with which of the fifty per cent of Local Strategic Partnerships and Community Strategy Partnerships in England and Wales to engage. An evaluation in 2004 found that twenty three of the Environment Agency's twenty six Area teams are working with one or more LSPs in local authorities identified by the IMD for both England and Wales as falling within the top fifty per cent of the most deprived communities (Walker, 2003). So, the Environment Agency is meeting its target to work with fifty per cent of LSPs. However, we still do not yet know - and need to assess how community strategies reflect environmental priorities and how LSPs are contributing to reducing environmental inequalities¹⁴.

¹³ For example, I took part in a workshop on Strategic Risk Assessment for agriculture, 9 March 2004, and am a board member for the Managing Environmental Hazards Project, which aims to explore the factors taken into account and the consistency in the application of risk assessment across the Environment Agency.

¹⁴ In December 2005 an assessment was undertaken of what has been achieved through the Environment Agency's involvement in Local Strategic Partnerships in England and Community Strategy Partnerships in Wales.

4.3.4 Environment Agency regulation and policy

a) Flood Risk Management

It was initially envisaged by myself and the Social Policy Manager that one outcome from the internal workshop in July 2003 would be the development of three functional working groups to help develop the Environment Agency's approach to addressing environmental inequalities through flood risk, IPC regulation and air quality policy. However, it was agreed by the workshop participants, and later with the Social Policy Manager, that different approaches might be needed and should be developed according to the needs of those policy makers working on each of these issues in question. My work in relation to flood risk management was taken forward through a series of infrequent meetings between the Social Policy Manager and I with the Flood Defence Policy Team. Our work was then latterly shaped by opportune inputs into the development of the government's new strategy for managing flood risk (Defra, 2004b).

The Environment Agency's vision for flood risk management is that 'flood warnings and sustainable defences will continue to prevent deaths from flooding. Property and distress will be minimised' (EA, 2000a). Corporate targets therefore focus the organisation's work on minimising the risk of flooding, protecting areas of high risk, and improving the standards of defences and flood warnings in flood risk areas. At the same time, the Environment Agency wishes to see that consistent standards of flood defences are provided for communities, based on an assessment of flood risk¹⁵.

However, this project's research had suggested that deprived communities tend to live in tidal floodplain areas, and could therefore be disproportionately at risk from flooding. The primary concern, expressed by some staff, is that decisions on investment on flood defences, which are driven largely by economic considerations, and have led to areas of low-economic value and deprivation receiving relatively less investment on flood protection (Walker et al, 2003b and in Chalmers, 2003b).

Anecdotal evidence had also suggested that wealthier communities are able to

¹⁵ The Environment Agency's Vision is that 'Consistent standards of flood defences based on flood risk will be in place to meet the challenges of climate change, and will be designed and constructed to deliver environmental benefits' (Environment Agency, 2001a).

engage more effectively in the planning process, and argue for greater spending in their areas. In order to address this, the Environment Agency's staff identified a need to change the appraisal and priority-scoring system used to target resources so that they better reflect the varying levels of vulnerability experienced by deprived communities.

At present, a Social Flood and Vulnerability Index (SFVI) is used to take account of vulnerable social groups in decision-making (Tapsell et al, 2002), and is expected to be used to develop catchment flood management plans (CFMPs). However, currently, little weight is given to these social factors in the assessment of flood risk for CFMPs. In meetings with the Flood Defence Policy Team and the Flood Defence Policy Advisor, we agreed that there is a need to adopt criteria which could define social deprivation in a way that could usefully inform the assessment of risk and the management of flood defence assets¹⁶.

The development of the new pan-government strategy for flood and coastal erosion risk management¹⁷ presented a critical opportunity to highlight the Environment Agency's concerns that the Strategy 'maximises the contribution to all people, especially those most at risk'¹⁸. At their first meeting in October 2003, the cross-government Strategy Board noted that 'environmental and social factors were being underplayed in the quantification of risk'. Taking this as an indication of their support for the inclusion of social factors in risk assessment, the Flood Risk Management Policy Advisor and Social Policy Manager and I recommended that the government 'broaden the current National Assessment of Defence Needs and Costs (NADNAC) and Integrated Policy Appraisal tool to address a wider set of public values [beyond financial capital], including social inequalities, regeneration and conservation'¹⁹.

¹⁶ Social / Sustainable Development Meeting with Flood Defence Policy, 13 May 2003, Birmingham; with follow-up meetings with Flood Risk Management policy on 20 May, 29 July, 19 November 2003, 22 January, 10 March, 16 March 2004.

¹⁷ Defra (2004) Making Space for Water: Strategy for consultation, May 2004.

¹⁸ Colvin, J. and Chapman, J. (2003). Development of Defra pan-Government Flood Strategy (proposal to Pam Gilder for the Social Policy Team's input to the Strategy, 19 November 2003).

¹⁹ Colvin, J and Chapman, J. (26 January 2004). Developing a new strategy for flood and coastal erosion risk management, Second meeting of the Programme Board, Briefing for David King.

Defra showed some support for changing the weightings given to economic and social criteria, and presenting flood management options in a way that stakeholders can engage with. They were also supportive of using a local catchment-based case study to demonstrate how flood management could contribute to other government objectives²⁰. Further research to support this has yet to be carried out, principally as the release of the Environment Agency's new Indicative Floodplain Maps which will provide a better assessment of flood risk had yet to be published. The impact of this work on the government's approach to flood risk management is presented in section 5.3.

b) Integrated Pollution Control (IPC)

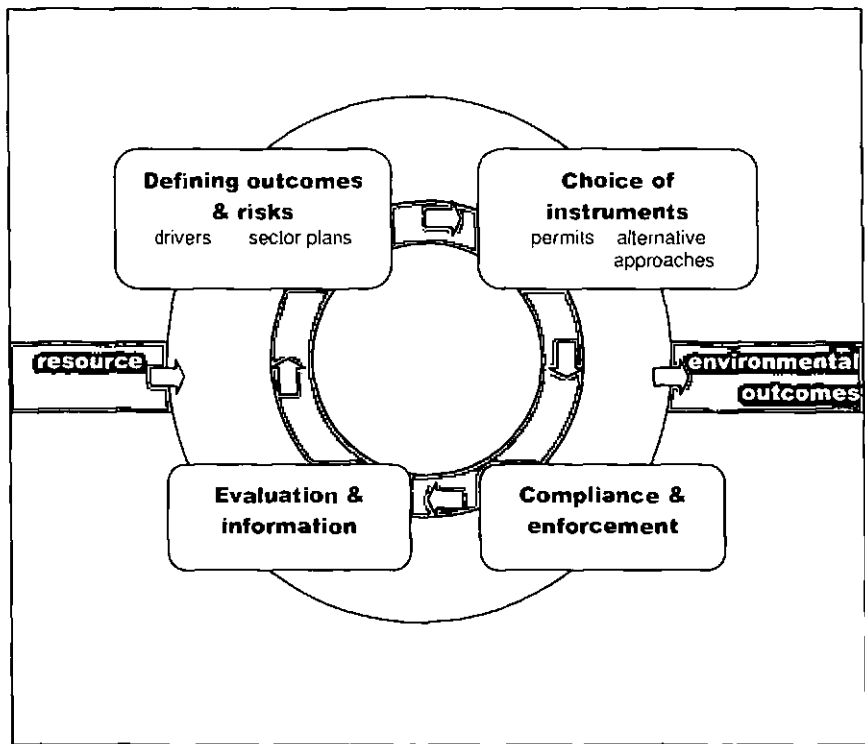
At the July 2003 workshop, staff identified that better information on existing and new sources of risk to environmental quality in deprived areas would help to inform decisions about the distribution and impacts of new PPC regulated sites. They also suggested that the Environment Agency could investigate the value of using 'poverty-pollution hotspots' to prioritise environmental improvements and regeneration. However, locally-defined analysis would be needed to examine the complexity of the interaction between environmental impacts and health to better inform policy.

In a paper to the Policy Steering Group in December 2003, the Head of Environmental Policy and I proposed that the Environment Agency should 'scrutinise our compliance and enforcement process to ensure that we are doing what we can to reduce risks in deprived communities' (see Annex 6). While the Directors responded cautiously to this proposal, the Regulatory Policy team were evidently keen to explore how addressing environmental inequalities could be used to make the Environment Agency's recently published model for modern regulation more effective (see figure 4.10)²¹.

²⁰ Environment Agency/Defra meeting to discuss the draft Emerging DEFRA Flood Strategy and Integrated Policy Appraisal. 19 December 2003.

²¹ Meeting between Helen Chalmers and Regulatory Policy Manager, 27 January 2004, IPC Regulation and Deprivation.

Figure 4.10: The Environment Agency's model of modern regulation



Source: Environment Agency (2003d). *Delivering for the Environment: A 21st Century Approach to Regulation*. Bristol: Environment Agency.

Firstly, it was clear from discussions with Regulatory Policy that the risks to people, and in particular, deprived communities need to be addressed at the earliest stage in shaping the drivers and defining the outcomes that we wish to achieve. European directives, legislation and national strategies provide the strategic framework in which decisions around industrial processes and their location are made. For example, the UK Waste Strategy with its focus on diverting waste away from landfill is expected to lead to more applications for waste incinerators, particularly in those local authorities that are doing less well in meeting national recycling targets, which should include those in deprived areas. It was suggested that the Environment Agency could become 'more bullish' in its advice to local authorities on planning decisions where we saw environmental risks to deprived populations. However, limited data and information about the 'synergistic impacts of new sources of air pollution and risk to people's health... [for example] from new entrant processes under the PPC regime' exist and could be a major barrier to developing this approach.

Secondly, Sector Plans, which are used by Environment Agency's to set out its vision for different industrial sectors, are thought to provide an ideal opportunity for defining the social and environmental risks to different social groups of industrial processes. Indeed, a social policy colleague and I had already helped to design a process for the Environment Agency to involve stakeholders in developing sector plans, and advised that they consider the social impacts in its risk-based approach and make reference to environmental justice as a driver for sustainable development²².

When granting permits for new industries under the Pollution Prevention and Control (PPC) regime, the Environment Agency assesses environmental risks according to the use of Best Available Technology to reduce environmental pollution. At the same time the current planning and permitting regime only allows the Environment Agency to comment on single applications for IPC sites (e.g. waste management facilities). This makes the process resource intensive and difficult to assess the environmental and human health impacts in the context of the cumulative impacts of existing sources of pollution, e.g. from traffic. Yet, it was thought that this assessment could be more effective if the impacts of these technologies were understood in the context of other multiple environmental factors and their impact on different social groups, as well as taking into account different people's perceptions of 'acceptable levels of concentrations and risks'. Here, the PIR team were already working with the Health & Safety Executive on strategic spatial planning policy around sensitive major hazard sites, and on proposals for the development of Spatial Planning Distances around hazardous sites and for the involvement of stakeholders in developing acceptable levels of risk.

Thirdly, to assess a facility's compliance with its permit conditions, and determine the regulatory resources required to monitor performance, the Environment Agency undertakes an Operator Performance and Risk Appraisal (OPRA). The new Environmental Protection OPRA assesses the complexity of the permitted activities, its emissions, location and operator performance. But while it takes account of the

risk to vulnerable environmental receptors such as Sites of Special Scientific Interest and Groundwater Protection Zones, only the proximity of residential areas, schools and hospitals are considered, with little evaluation of the relative risks to different vulnerable human receptors.

Finally, it was suggested that the Environment Agency should be more open and transparent in the way it makes decisions on permits, standards and enforcement, and before the it receives applications for new industrial sites and processes. While some people appeared to recognise how stakeholder engagement could result in more informed and effective decision-making, others were clearly concerned about the challenges of effectively managing local communities' protests about contentious applications. The Social Policy Manager and I explored how we can learn from the organisation's experience of engaging with stakeholders around contentious sites, and how the concept of environmental citizenship can be used to inform the Environment Agency's approach in a paper (Colvin and Chalmers, 2003). As a result of these discussions, the Regulatory Policy team are investigating how the Aarhus Convention on participation in environmental decision-making could be applied to the PPC regulation.

I drew heavily on these ideas, discussions with the Scottish Environmental Protection Agency (SEPA) and work by the US EPA (NEJAC, 1999 and 2003a) to prepare a presentation for the Director of Environmental Protection to the cross-government Environment & Social Justice Working Group (Skinner, 2004). As a think piece on how regulation could contribute to environment and social justice, the presentation (in appended in Annex 11) recommended that:

- equity should be added as a sixth principle to the government's 'Better Regulation' principles;
- legislation and policy should promote environmental equity;
- better measurement and information on the social and environmental risks to communities to be developed;

²² Email correspondence from Social Policy Advisor and the worker-researcher to the Sector Plans Policy Advisor, 20 February 2003.

- proportionate environmental standards reflect the differential exposure and risks to different social groups;
- risk assessment could be strengthened by taking into account social deprivation and cumulative environmental impacts;
- fiscal measures such as environmental taxes are used to provide incentives for environmental good practice and fund environmental improvements in deprived areas;
- enforcement and penalties should reflect risks to the environment and communities, especially where they are aggregated, disproportionate and inequitable.

Developing this presentation with the Director of Environmental Protection provided a valuable first step in exploring some of these ideas and opportunities. A more comprehensive review of the regulatory system and how it can contribute to preventing and addressing environmental inequalities is needed.

c) Air Quality

The Environment Agency's willingness to change its approach to industrial regulation is considerably hampered by the overriding concern that any action to prevent or address the impacts of IPC sites is undermined by the greater contribution that transport makes to poor air quality in deprived areas. For example, a policy development advisor commented that:

*'it is our hope to highlight that transport getting away with increased emissions, increases overall background emissions. And it is against these emissions we must regulate IPC/PPC sites. Therefore at some point the crunch will come and there can be no more improvements in air quality without dramatic interventions in transport policy or on our risk based approach'*²³.

For this reason, there was considerable support amongst policy staff working on air quality that the Environment Agency's effort to improve air quality should be proportionate to the various pollutants' risks to human health and people's quality of

life. Discussions around how the Environment Agency could address inequalities in the distribution of poor air quality were followed up in a meeting with staff from the Air and Chemicals policy team, and advisors on human health and risk assessment. Their first concern was that the analysis had revealed conflicting results in the correlations between air quality and social deprivation in England and Wales. It was strongly felt that the Environment Agency needed to take a "even-handed approach". They recommended that tools such as Integrated Policy Appraisal (IPA) are used to assess the relative risks, costs and benefits of decisions, and where a formal RIA is required, the Environment Agency should also be making specific reference to equity and fairness.

At present, the Environment Agency is a statutory consultee in the preparation of Air Quality Management Strategies (AQMS) and action plans. Yet its advice is usually restricted to the impacts of regulated processes, and rarely provides advice in the context of social, health or economic concerns. So it was felt by those managing policy in this area that the organisation could strengthen its contribution to improving and protecting air quality by providing information and advice on the environmental and health impacts of new developments and their contribution to environmental inequalities. One opportunity that the group identified for doing this is through the Environment Agency's advice to local authorities, which could help reinforce the importance of environmental equity in planning decisions, and in the development of AQMS. Although, in an area where the Environment Agency's resources are considerably stretched, influencing strategic planning documents, such as regional spatial strategies could be more effective. As a result, guidance on transport is being produced for Area and Regional staff to use in their input to Regional Transport Strategies, and there is support for incorporating messages about environmental inequalities²⁴.

An invitation to speak at the National Society for Clean Air conference in April 2004 provided an opportunity to communicate and test some of this emerging thinking

²³ Email correspondence from Policy Development Advisor, 8 March 2004, Air Quality and Deprivation.

²⁴ Email correspondence from Policy Development Advisor, 8 March 2004.

with Defra's Air Quality Group, consultants and local authorities²⁵. In our presentation (appended in Annex 8), the Head of Policy Development and Promotion and I recommended that there is a need to better assess the risk of developments and air quality to human health and overall quality of life. This will need better information and understanding of these interactions to inform planning and decision making at a local level. We also took it as an opportunity to focus on what others could do by recommending that inequalities in poor air quality be addressed through:

- the forthcoming review of the National Air Quality Strategy;
- integrating air quality across government policy, local development, transport planning and Community Strategies;
- taking a wider look at the environmental impacts on deprived, as well as vulnerable groups in the development of the European Union Strategy on Environment and Health;
- Air Quality Management Strategies and Action Plans, and ensuring that they do not displace poor air quality to deprived areas, where 'excellent' authorities are able to opt out of producing AQM plans (Chalmers and Gilder, 2004).

Our presentation subsequently prompted discussions with Defra's Air Environment Group, and my involvement in Defra's next round of research on air quality and deprivation in 2005.

4.3.5 A real test of the Environment Agency's thinking on waste management regulation in a deprived area

However, before we had developed any of this thinking, the Environment Agency's position on protecting the environment in deprived areas was tested by a real, and controversial example in the Northeast, see samples of newspaper headlines below²⁶.

²⁵ National Society for Clean Air Spring Workshop: Planning, Health & Climate Change, 22-23 April 2004, Abingdon.

²⁶ For more information on the US Naval Ships, see <http://www.environment-agency.gov.uk/regions/northeast>

Fury as US dumps its toxic ships in Britain Rusting, toxic 'ghost fleet' on way to UK Toxic ship deal prompts EU inquiry

In August 2003, Friends of the Earth challenged the Environment Agency's position on the 'precautionary principle' and 'environmental justice'. They did so in relation to the application by the company Able UK to dismantle American naval vessels in Teeside – the location of chemical and industrial plants, and one of the most deprived areas in England. Both principles form part of the foundations of the Environment Agency's statutory guidance, and the precautionary principle features in many relevant areas of policy, including on waste licensing and human health. The Environment Agency regulates to protect the environment and human health, and based its decision on an assessment of the environmental risks. However, it is not currently able to take account of social issues or environmental justice in its regulatory decisions (Environment Agency, 2003c). The Environment Agency decided to disallow the dismantling of the vessels, on regulatory grounds, and because Able UK did not have the right permissions and agreements in place.

At the same time, the Social Policy Manager and I recommended that 'given the history and current status of the Graythorp site in terms of high environmental inequality, [the Environment Agency] should consider how best we can work with the local community to come to the best decision in terms of responding to Able UK's application for a variation to their TERRC waste management license'. Moreover, we proposed that the Environment Agency make 'an additional effort – to engage with those elements of the community most likely to be excluded from the decision-making process and /or most likely to be impacted by the decision'. The Environment Agency's North East Regional and Area teams have since made considerable efforts to work with the community and its representatives from the IMPACT group, Friends of the Earth, the local authority and health professionals.

Working with staff across the Environment Agency to make sense of evidence, provided invaluable insights into their knowledge of why poor environmental quality tends to be concentrated in deprived areas, and the opportunities for addressing these inequalities within the policy process. At a strategic level, this stage of the action research process enabled me to be actively involved in integrating social equity into tools for policy appraisal, risk assessment, and for prioritising the Environment Agency's engagement in deprived areas. But it also helped identify, with relevant policy advisors, the opportunities for taking account of social deprivation in the prioritisation of flood defence schemes, the Environment Agency's approach to modern regulation, and in its advice to local planning authorities on air quality. Despite these opportunities, a live example in the North East exposed the current barriers to the Environment Agency considering environmental equity in its operational and regulatory decisions.

4.4 Stage 4: Securing commitment that policies will reflect the need to address environmental inequalities (December 2003 – September 2004)

The fourth stage of this action research process involved securing commitment to the changes needed in Environment Agency and government policy. During this period our focus was to agree a formal position for the Environment Agency in addressing environmental inequalities. The second priority was to continue to work with Defra and the Office of the Deputy Prime Minister to shape their policy commitments on this agenda.



Escape from pollutionville

4.4.1 Developing and agreeing the Environment Agency's policy position on addressing environmental inequalities

While the Environment Agency's position is – in reality represented by the actions of its staff and operational decisions, its formal position is often stated through public statements and policies. It was under the intense media scrutiny around the arrival of the 'Ghost Ships' and the threat of legal action against the Environment Agency, that I tried to develop our position in consultation with internal staff. At the same time I tried to secure a public commitment from the Directors and Chief Executive for addressing environmental inequalities.

In July 2003, the Chief Executive accepted an invitation to write an article for *The New Statesman* magazine. Seeing this as an ideal forum in which to launch the findings from the research undertaken with Staffordshire and Leeds Universities, as well as make connections with the government's inequalities agenda, the Head of Environmental Policy and I provided a briefing and draft article for Barbara Young. However, there were clearly strong concerns that highlighting these issues at this time presented legal and corporate risks, as well as risks to the Environment Agency's relationships with business, the government and the communities in which it works. In the end therefore, the article was not published.

However, with the analysis of research completed in July 2003, there was increasing pressure to report back to our external stakeholders on the steering group, and to release the findings into the public domain. At the workshop in November 2003, the Head of Environmental Policy and I presented the our current thinking about what the analysis, and working with our staff to understand environmental inequalities had revealed, and asked for feedback from the steering group. The workshop also provided an opportunity to reflect on how other organisations represented at the meeting had progressed action to address environmental inequalities. For example, ODPM had started to take account of environmental dimensions of disadvantage, and the Secretary of State for the Environment had recently made a statement which made the connections between environment and social justice. At the Environment Agency's annual conference the previous month (October 2003), Margaret Beckett had said:

"It is the poor who suffer most from inadequate sanitation, unsafe water, misused chemicals, poor quality land, homes and food. Globally, the adverse effects of environmental damage will affect the poorest most severely. Locally, poor environmental quality leads to spirals of degradation, promotes fear of crime and exacerbates the decline of neighbourhoods. Good quality environments support regeneration and attract investment ... social justice demands that we act ... [and that we can have a greater impact] "if you can show the link between poverty, the environment and social justice" (Beckett, 2003).

Yet, despite this political support, there was still considerable unease about the Environment Agency actively promoting this agenda, and leading change in environmental policy without further discussion with – and leadership from government. This was also evident from the Directors' response to our paper on 'addressing environmental inequalities' in December 2003²⁷. In this paper (appended in Annex 6), the Head of Environmental Policy and I presented a draft policy framework which included three principles:

- (i) Doing what we [the Environment Agency] can to reduce environmental inequalities and to ensure that we do not inadvertently contribute to further inequalities overall;
- (ii) Ensuring the environment is recognised as an important dimension of disadvantage in national, regional and local strategies;
- (iii) Working harder to encourage participation of deprived communities in environmental decision making, so that they are given appropriate information and better involved in decisions that affect them.

The Directors supported the principle that the Environment Agency should do 'what we can to reduce risks in deprived communities'. However concerns remained about the need to balance advocating solutions to others whilst not raising expectations 'that the Agency can solve the problem' (PSG, 2003). Despite the constructive work to identify opportunities for change within environmental policy

in stage three, considerable unease remained about actively promoting the environmental inequalities agenda and leading change in this policy arena without further discussions with - and leadership from government²⁸. In contrast, when the same framework was presented to the policy steering group eight months later in July 2004, the Directors agreed to publicise the Environment Agency's policy commitments as well as those it would like to see from others.

Introducing the position statement, the paper to PSG (presented in Annex 9) sets the scene and framework for how the Environment Agency should position itself. In the paper, the Head of Environmental Policy and I proposed that 'we should continue to champion and shape the developing policy agenda in this area, but we must also start to balance this with taking what action we can to address environmental inequalities through our own work' (PSG, 2004). It also suggests that because 'Our understanding (across government) of many of the issues around environmental inequalities remains sketchy' ... 'much of our influencing role must focus on the need for further, joint research into the issues and the most effective policy responses at a national, regional and local level', such as 'the basket of measures that the NRU uses to tackle multiple deprivation'.

The position statement, shown in figure 4.12, presents the key issues around the relationships between environmental quality and social deprivation; the Environment Agency's role in tackling environmental inequalities; and the solutions it helped identify which the Environment Agency should advocate to others.

²⁷ Madden, P. and Chalmers, H. (26 November 2003). *Addressing environmental inequalities: Paper to the Environment Agency's Policy Steering Group*. Bristol: Environment Agency (unpublished).

²⁸ Email correspondence from the Head of Policy Development and Promotion to the worker-researcher, 1 February 2004, 'at the moment the social policy gives us the legitimacy we need. We don't yet have the detailed steer for staff but our work on modern regulation and flood risk management will help drive the detail of what it means for our policies and processes. The PSG minutes show that the Agency wants to show that there are many players in this game (which there are) and now is not the time to push for another internal policy given that [the Head of Environmental Policy] described this as work in progress. We must play a tactical game - we have a real chance to move forward the government policy context for environmental inequalities with Defra's growing interest. Once we have this in place it will be easier to argue for a clear response from the Agency.'

Figure 4.12: Environment Agency policy position: Addressing environmental inequalities

Addressing environmental inequalities

Key issues

A clean and healthy environment is vital for everyone's quality of life. While the overall quality of our environment is improving, the quality of the environment can vary between different areas and communities. People who are socially and economically disadvantaged often live in the worst environments. For example, those living in the most deprived parts of England experience the worst air quality and have less access to green space and adequate housing.

These problems can affect people's health and well being and can add to the burden of social and economic deprivation. They can also limit the opportunities available for people to improve their lives and undermine attempts to renew local neighbourhoods. Those affected tend to be the most vulnerable and excluded in society.

The causes of these inequalities are often complex and long-standing. Some problems are due to the historical location of industry and communities; others are the result of the impacts of new developments such as traffic. Often these environmental problems are caused by the actions of others who do not live in the affected community. Often those most affected have not been involved in the decisions that affect the quality of their environment.

Tackling environmental inequalities and ensuring that all people have access to a good quality environment in the future is critical to sustainable development.

The Environment Agency's Role

Our role is to protect the environment and human health through our work in managing flood risk, and improving and protecting the quality of land, air and water. We aim to be a firm and fair regulator and contribute to a better quality of life for everyone, whatever their background and wherever they live.

To inform our approach, we carry out research on environmental inequalities and work with others to develop the most effective ways of tackling them.

We regulate the release of pollutants from large industrial processes. We also provide information and advice about the environmental impacts of developments to inform local and regional planning decisions that affect their location. We take into account the social and economic impacts of our work whenever possible, and advise government on environmental inequality.

We also promote opportunities for fishing and the recreational use of waterways, to help people, including disadvantaged groups, enjoy the environment.

We work in partnership with others to promote sustainable development, focusing our efforts where we can most benefit the environment, and by including the interests of disadvantaged communities in our work. We also encourage participation of deprived and excluded communities in decisions that affect their environment.

Solutions – we call for:

Government, business and society all have a role to play in addressing environmental inequalities at a national, regional and local level. We will do what we can to address environmental inequalities and ensure that we do not contribute to further inequalities in the future. We want to see:

- 1. A better understanding of environmental inequalities and the most effective ways of addressing them.** Our understanding of environmental inequalities is growing. We will continue to carry out research to build on this knowledge - more is needed to understand the cumulative impact of environmental inequalities on people's health and quality of life in both rural and urban areas. A better understanding is needed of where existing mechanisms are reinforcing environmental inequalities; and how government and others can best respond.
- 2. Government policy promotes a reduction in environmental inequalities.** We welcome the proposal that environment and social justice should be a key theme in the UK Sustainable Development Strategy. We will help by scrutinising our approach to modern regulation and flood risk management to help reduce the risks to deprived communities. We want to see government:
 - integrate greater environmental equality across its policies;
 - evaluate key new policies for their impacts on those living in the worst environments;
 - develop tools such as equity assessments to ensure that policy does not contribute to environmental inequalities but helps address them.
- 3. Government to address environmental inequalities through tackling disadvantage.** We welcome moves by the Office of the Deputy Prime Minister and Welsh Assembly Government to recognise the environmental aspects of multiple deprivation. We now want to see:
 - future reviews of the English and Welsh Indices of Multiple Deprivation use wider indicators of environmental deprivation as our understanding of environmental inequalities develops;
 - the National Strategy for Neighbourhood Renewal and supporting programmes revised to reflect our developing understanding of the environmental dimensions of deprivation;
 - the environment to be recognised in government policy and spending that tackles disadvantage and neighbourhood renewal, for example through revised Public Service Agreements;
 - strategies for tackling health inequalities which recognise environmental factors, such as air quality.
- 4. Regional and local planning prevent environmental inequalities.** Spatial planning often determines the location of environmental hazards and services that affect people's quality of life. We will carry out Strategic Environmental Assessments to assess the impact of our plans and programmes on people and their health. We also want:
 - regional and local planning authorities to assess how their decisions and development plans will affect environmental inequality;
 - planning authorities to assess the cumulative impacts of new development and location of sites such as waste management facilities on environmental equity;
 - Local Strategic Partnerships and Community Planning to address environmental inequalities through the development of Community Strategies in deprived areas.

- 5. Communities supported and involved in decisions that affect their local environment.** We will continue to provide information and support processes that help people to make better decisions about their environment. We want improved action by government and others to involve and include the interests of disadvantaged communities in environmental decision-making and ensure that environmental responsibilities are taken seriously by all.

Background

- Public opinion surveys have shown that people living in deprived areas are just as concerned about the environment as other people, and listed pollution, poor public transport and the appearance of their neighbourhoods as major concerns (Social Exclusion Unit, 1998).
- There are eight times more people in the most deprived 10% of the population living in tidal floodplains than the least deprived 10% (Walker et al, 2003). River water quality is worse in the most deprived areas in England, where up to 50% of watercourses are extensively modified, providing less natural habitats for wildlife (Environment Agency, 2002).
- People in the most deprived 10% of areas in England experience the worst air quality, and 41% higher concentrations of nitrogen dioxide from transport and industry than the average (Walker et al, 2003). In Wales, the picture is very different, where the highest concentrations of air pollution are found in the least deprived wards.
- Transport is the main contributor to poor air quality in Air Quality Management Areas, and the cause of respiratory illness and deaths amongst vulnerable groups such as young children. These groups are least likely to live in areas of high car ownership (Stevenson et al, 1998; Mitchell, 2003).
- Often solutions, such as public transport helping to reduce poor air quality, are not available to poorer communities, limiting their opportunities and choices. Over a 12-month period, 1.4 million people missed, turned down or chose not to seek medical help because of transport problems (Social Exclusion Unit, 2003).
- The revised Indices of Deprivation (ID, 2004) now include indicators on the quality of housing, air quality and road traffic accidents, alongside the six original indices that cover (income, employment, health deprivation and disability, education skills and training, housing, and geographical access to services). These are used to target policies and funding to improve the quality of life in disadvantaged communities.
- The Environment Agency promotes environmental well-being through our involvement in Local Strategic Partnerships and Community Strategy Partnerships in 70% of the 88 most deprived areas in England and 90% of the Community First Pockets of Deprivation in Wales.
- The Aarhus Convention (United Nations ECE/CEP/43) is helping to promote environmental justice. It advocates the right to environmental information, the right to participate in decision-making processes and the right to access to justice in environmental matters.

A number of factors appear to have contributed to this change; some reflecting initiatives by others and myself; others because of external developments. The first was the Directors' decision to publish the research undertaken by Staffordshire and Leeds Universities in 2003. Despite some caution, in December 2003, the PSG agreed to publish the report as an "interim, issue raising report" as soon as possible. So in January 2004, we launched the research with an article in *The Guardian* Society supplement. This commentary piece by Peter Madden used our evidence on flooding, IPC and air quality to illustrate a broader picture of environmental inequalities and the need for 'a better integration of environmental factors into social and economic programmes', see figure 4.13 (Madden, 2004). The article sparked considerable national media attention²⁹; featuring on Radio 4's Today Programme, which reported that:

"Poorer areas face higher levels of pollution: The Environment Agency says the poorest areas of England are more likely to suffer from higher levels of pollution. It is calling on ministers to take environmental practice into account whilst tackling problems of social deprivation".

Parallel articles also featured in regional newspapers, particularly in regions where the report had identified 'poverty-pollution hotspots'. For example, in Sheffield, the Star newspaper linked our research to Friends of the Earth's latest analysis, which claimed that waste incinerators were disproportionately located in the most deprived wards within local authority areas, and a campaign to close a local incinerator (Lowndes, 2004). The article also received a positive response from government, with Defra signalling their intention to take the issues it raised forward across government³⁰.

Figure 4.13: Research and policy position reported in Guardian Society, 15 January 2004

²⁹ Media coverage included: Radio 5, ENDS Daily, The Scotsman, BBC website, Manchester Evening News, Sheffield Star, Nottingham Evening Post, Environmental Business Journal, Innovations Report: Forum for Science, Industry and Business.

³⁰ Email correspondence from the Sustainable Development Unit, Defra to the Environment Agency's Head of Environmental Policy, 13 January 2004. 'Congrats on this piece of work and the article too. I am meeting [Special Advisor to Secretary of State for the Environment] next week to talk about Defra / Whitehall work on this to move it forward. I am preparing a discussion paper for Whitehall and will be organising a cross-Departmental workshop probably for Feb or March. I will send a draft copy of the paper to you, an invitation to the workshop and will also keep in touch generally.'

Escape from pollutionville

Comment Peter Madden on refocusing regeneration to prevent the poor being trapped in the worst environments

Tony Crosland, Labour's environment secretary 1974-76, argued that green issues are the preserve of the affluent middle classes who want to pull the ladder up behind them. And research by Mori shows that "if you are professional and middle class you are more likely to be environmentally aware and more likely, or able, to take action."

Yet overwhelmingly, it is the poor who live in the worst environments and suffer most from environmental problems. Poorer people are twice as likely to live near polluting factories, and children from families on low incomes are five times more likely to be killed by road traffic than children from affluent areas.

Now, new Environment Agency research provides further evidence that deprived communities experience disproportionate levels of environmental degradation.

They suffer the worst air quality. In England, they experience the highest concentrations of fine particulates, sulphur dioxide, carbon monoxide, and benzene, and are exposed to 41% higher concentrations of nitrogen dioxide than the average.

They are home also to disproportionate numbers of industrial sites. Among the wards with the most deprived 10% of the population, there are five times as many sites and seven times as many emission sources. These sites are more clustered together, on average produce greater numbers of emissions, present a greater pollution hazard and produce more "offensive" pollutants and higher emissions of carcinogens.

The picture on flood risk is more mixed. There are eight times more people among the poorest 10% of the population living in tidal floodplains, than the richest 10%. However, wealthy people are more likely to live in fluvial floodplains. And the majority of people living in floodplains will be in major cities where flood protection is very good.

Though the analysis shows that poor people tend to live nearer to environmental problems, the impact on their health is not clear.

The reasons for environmental inequality are complex and long-standing. National and local government will be responsible – in particular through the planning system – for many of the issues relating to proximity to polluting processes or flood risk.

Some of the problem is, of course, due to historical legacy. An industrial past helped create communities living close to, and dependent on, their workplaces. Siting of industry, the

ability of the wealthy to move away from polluted areas, changes in neighbourhoods, and land use planning may all enforce environmental inequalities. Lack of participation in local democratic and planning processes could also have an impact.

So what can be done to tackle these problems? First, we need better research and evidence, particularly about the cumulative impacts of a range of social deprivation issues, such as poor housing, unemployment or low levels of education.

Society has to recognise its responsibility in creating environmental problems, and in dealing with the consequences. For example, the volume of household waste is set to double over the next 20 years. Unless we do better at reducing and recycling then we will need waste disposal facilities – and people will have to live near them.

Government should focus more on this. Recent initiatives on "liveability" have begun to tackle the environ-

mental issues of most concern to poor people; the Office of the Deputy Prime Minister is making environmental issues a more central part of its work to tackle deprivation and promote neighbourhood renewal; and the Department for Environment, Food and Rural Affairs is looking closely at environmental and social justice issues as part of its work on sustainable development.

But Britain must do a better job of bringing together the social and environmental agendas. Anti-poverty and regeneration efforts have too often focused on social and economic issues, ignoring the environmental. And environmentalists have been guilty of not taking poverty seriously. We need a better integration of environmental factors into social and economic programmes which are, after all, about improving the quality of people's lives.

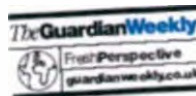
Peter Madden is head of environmental policy at the Environment Agency.



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4.4.2 Working with Defra to understand the implications of environmental inequalities for government policy

The second significant change was Defra's growing commitment to championing environmental equity across government, and its look to the Environment Agency for support. In December 2003, I was invited to attend a workshop for Defra staff to explore the problems, desired outcomes, barriers, and solutions to environmental equity³¹. Defra's Director of Environmental Protection and the Head of Environment Protection Strategy presented a framework for the development of an environment and social justice policy. They also outlined the relevance of environmental equity to Defra's five strategic priorities: climate change and energy; management and protection of natural resources; sustainable consumption and production; sustainable rural communities; and sustainable food and farming.

There was a clear commitment from those leading the workshop for change: "Defra's commitment to environmental equity can't just be a few nice sentences added onto the Sustainable Development strategy" ... "we should be sure what we will deliver and for whom". On the other hand, there were indications from others that these issues were already adequately taken addressed by policy and regulatory impact assessment tools.

To raise awareness of these issues across government, in March 2004 Defra led a cross-departmental workshop on environment and social justice. Defra's framework, which covered both the procedural and substantive aspects of environmental justice encompassed different interests and policy priorities across government by defining 'environment and social justice' under the two themes of:

- fairer choices, eg access to environmental services, information and justice;
- decent places, eg transport, noise, green space, air quality and protection from environmental risks.

³¹ Defra Workshop on Environmental Equity, 9 December 2003, London.

In our roles as 'expert witnesses' the Head of Environmental Policy and I were asked to facilitate two of the workshop groups, which provided us with an opportunity to promote the Environment Agency's environmental priorities, as well as gain an insight into the understanding and views of different government departments. Among the insights, the departments highlighted the need for:

- a clearer framework for government intervention which articulates the rationale, objectives and limits of intervention and responsibilities;
- environment and social justice integrated into all relevant policy areas;
- action and policy customised to local/neighbourhood needs;
- people to be empowered by emphasising their rights and responsibilities.

Government departments expressed clear support for environment and social justice. They also identified opportunities for its promotion through programmes such as the Department of Health's Action Plan for Tackling Health Inequalities, the Home Office's Active Communities work, and the Department of Transport's work with the Social Exclusion Unit to promote access to transport. However, in a climate of competing cross-cutting agendas, there were also some government officials who questioned the added value that this new agenda presented for delivering their department's existing public service agreements and floor targets. Nevertheless departmental representatives identified, and developed action plans, for seven priorities for delivering environment and social justice more effectively:

- (i) More shared government priorities backed up by joint Public Service Agreements
- (ii) Community empowerment through real delegation of power and responsibility- we really need to listen to the community
- (iii) Assessing the community's needs from the bottom up
- (iv) Sustainable development taken out of Defra and placed centrally e.g. within the Cabinet Office
- (v) Make environmental and social policy proofing mandatory
- (vi) Establish basic minimum standards of environmental rights

- (vii) Assess cumulative impact of plans with communities (Woodward and Lloyd, 2004).

In order to take forward these action plans, there was considerable support for the Environment Agency's suggestion of a cross-departmental working group to build on the work of our project steering group. This group would steer the development of an environment and social justice theme within the revised UK Sustainable Development Strategy, which was due to be published in early 2005.

4.4.3 Securing cross-government commitment to environment and social justice and addressing environmental inequalities

In April 2004, the government published its consultation paper on the new UK Sustainable Development Strategy (Defra, 2004a). Of the five key themes, 'environment and social justice' was identified as a way of more effectively addressing 'people's social, economic and environmental needs' (see Annex 7). Using the evidence developed by this project, the consultation paper showed that 'tackling environmental inequalities can help improve quality of life overall'. The government asked two questions of those consulted:

- 'how should we bring together 'environmental' and 'social' concerns at a national, regional or local level?'; and
- 'what more could be done to tackle environmental inequalities?'

To help answer these questions, in June 2004, Defra created a cross-government working group, chaired by Defra's Director of Strategy & Sustainable Development. The group was tasked with agreeing a set of feasible policy interventions to address environmental inequalities which could be included in the new UK Sustainable Development Strategy. The group comprised mainly those departments who expressed an interest in developing the theme, as well as some non-departmental public bodies and NGOs such as Groundwork UK and Friends of the Earth Scotland. I played a significant role in this group, and contributed to developing the policy options for environment and social justice. As well as attending workshops which

informed this theme³², I provided a response to the government's consultation for the new UK Sustainable Development Strategy called 'Taking it On'. The Environment Agency's response relating to environment and social justice recommended that:

- the evidence base on environmental inequalities and how to address them be improved;
- the government should take action to tackle environmental inequalities as part of its programmes to tackle disadvantage;
- communities be involved in decisions that affect their local environment;
- regional and local planning policies are used to prevent environmental inequalities (Environment Agency, 2004e).

The recommendations also informed my input into a paper to be presented to the ministerial Sustainable Development Strategy Programme Board³³ and subsequent contributions to drafting the Strategy's contribution to environment and social justice. An evaluation of the impact of this work to secure commitments to tackling environmental inequalities across government is presented in section five.

The third factor, which may have contributed to greater awareness and recognition of the importance of this issue within both the Environment Agency and across government, was a report by the Institute of Public Policy Research on 'Sustainability and Social Justice'. In 2004, the Environmental Policy Unit and I were invited to sponsor, and help edit, what was likely to be a highly influential in the development of the government's priorities for its next term, and was deliberately timed to influence the government's Spending Review 2004. The report examined the extent to which social justice had been integrated into the government's policies on: sustainable communities, transport, climate change, energy, waste, food & farming (Foley, 2004).

³² 'Environment & Social Justice': a consultation meeting as part of the UK Sustainable Development Strategy Review, 8 July 2004, Glasgow Caledonian University; and 'Black and Ethnic Minorities – Tackling Environmental and Social Inequalities': a workshop organised by Capacity Global, 13th July 2004, BMA House, London.

³³ Email from Helen Chalmers to the Sustainable Development Unit, Defra, 23 September 2004, Environment Agency response to Issues Paper on Environment & Social Justice.

Our involvement enabled us to develop the Agency's thinking on a broad range of policy agendas and for me to engage a variety of the Environment Agency's policy leads (on waste, agriculture and climate change) with whom I had not previously discussed issues of social justice. I provided advice on the report and co-ordinated comments on draft chapters from policy advisors across the Environment Agency. Examples of the report's recommendations can be found in figure 4.14.

Figure 4.14: Priorities for the government on sustainability and social justice

- Government ministers show leadership and press ahead with its commitment to develop a national entry level agri-environment scheme open to all farmers (p80);
- the Government should champion the idea of setting emission entitlements on a per capita basis at the international political stage, particularly while the UK holds the EU Presidency in the second half of 2005 (page 43);
- Warm Front grants be better targeted to those homes most in need, with suitable options for hard to heat homes to enable the scheme to more effectively move people out of fuel poverty and contribute to the delivery of the UK's Fuel Poverty Strategy (page 52);
- Households are charged according to the amount of unsorted residual waste they produce to increase recycling rates and reduce the total amount of waste produced (page 59);
- The revised Ten Year Plan for Transport in 2004 helps change the direction of transport policy so that it improves access to mobility that enhances the quality of life for all and ensures good environmental stewardship (page 24); and
- The Sustainable Communities Plan delivers genuinely mixed communities, new housing that meets minimum environmental standards (page 16).

Source: Foley, J. (ed.) (2004). Sustainability & Social Justice. London: Institute of Public Policy Research, pp.82.

4.4.4 Working with the Neighbourhood Renewal Unit to understand the environmental dimensions of multiple deprivation

The fourth factor shaping the Environment Agency's and government thinking was the Neighbourhood Renewal Unit's growing interest in the environmental dimensions of deprivation. In influencing specific streams of government policy, the project focused on working with the Neighbourhood Renewal Unit, which is responsible for tackling multiple deprivation in the UK. At the start, my energies were focused on encouraging the NRU to deliver on its commitment set out in the Office of the Deputy Prime Minister's *Living Places: Cleaner, Safer and Greener* strategy. In this document, ODPM had pledged to 'examine the extent to which poor local environmental quality is correlated to areas and households experiencing

multiple deprivation', and 'develop policy and deliver mechanisms to address these issues' (ODPM, 2002).

Research was commissioned by the NRU to examine different types of evidence, including the experience of local and national stakeholders of environmental exclusion, and to review the spectrum of national policy initiatives designed to address these issues. The review, which drew on our analysis of flooding, air quality and IPC sites, presented a comprehensive analysis of environmental concerns in deprived areas, with case study evidence that showed that environmental improvements provide a catalyst for wider social benefits and community involvement in regeneration. In addition, through interviews with government departments and stakeholders (including myself), the review identified a wide range of government initiatives that have a positive environmental impact, and recommended that more could be achieved by refining and better co-ordination of existing government policy (Brook Lyndhurst, 2004).

But most importantly, the project provided the focus for developing the NRU's understanding of environmental exclusion, and its relation to the Unit's other commitments on community safety, liveability and open space. Involving the NRU in the Environmental Equality Steering Group led to the Environment Agency being invited to be a member of their Environmental Exclusion Review project board. Between June 2003 and January 2004, the Social Policy Manager and I played a major part in helping to design the Environmental Exclusion Review. Our involvement helped ensure the NRU's narrative on environmental exclusion covered the full range of environmental issues, including both environmental protection (of primary interest to the Environment Agency) and 'liveability' issues such as litter and public space (of primary interest to ODPM).

At the same time, the ODPM was developing its understanding of the environmental aspects of deprivation. In July 2004 it consulted on the revision of the Index of Multiple Deprivation for England, and its proposals for new indicators of the 'Living Environment'. I co-ordinated the Environment Agency's consultation response, which welcomed the new indicators of air quality and road traffic accidents as measures of environmental deprivation. As our response, presented in Annex 5

shows, we also recommended that these indicators be given equal weight to those indicators of the 'indoor environment', such as the quality of social housing. Furthermore, the Environment Agency recommended that consideration be given to the inclusion of indicators reflecting wider aspects of the physical environment, such as flood risk, litter and fly-tipping.

Our collaborative work led to better working relations with the NRU Whitehall Team, and recommendations for developing further joint work in the future (Brook Lyndhurst, 2004). This was also due in no small part to the support of Dr. Helen Walker, who because of her recent secondment to the Environment Agency, and experience in environmental sustainability worked closely with the Whitehall team to make the connections with the Environment Agency's work. It was largely because of her interventions that I was invited to present at a specially convened internal forum for senior managers and Directors of the NRU in May 2004 (Chalmers, 2004b). Interestingly, while the forum was intended to consider the results of the NRU's environmental exclusion review, the title of the forum aligned the agenda much more closely to the Environment Agency's focus on addressing environmental inequalities³⁴. The most significant outcome of the forum was the acknowledgement by the majority of senior NRU managers present that environmental inequality is 'very important' to the NRU's policies and programmes. However, there was also some scepticism that integrating the environment into their existing strategy would make any difference to determining the eighty eight most deprived areas and the allocation of the Neighbourhood Renewal Fund.

It was also agreed, in line with the review's recommendations, that the NRU should further investigate how environmental inequality could be integrated within strategic mechanisms, such as public service agreements, the ODPM's five strategic objectives, and future reviews of the National Strategy for Neighbourhood Renewal. In support, the Environment Agency's response to the ODPM's consultation on its PSAs recommended that environmental inequalities be 'picked up in the updating of floor targets for neighbourhood renewal and social exclusion' (Environment Agency, 2004c). However, because these issues had only recently been explored, the

Environment Agency's final response was moderated with: 'it is premature to propose changes to this round of PSAs. However, this should be kept under review when the next round of PSAs are developed'.

On reflection, in order to secure commitment within the Environment Agency of the importance of addressing environmental inequalities, considerable work was required to shape the external policy drivers and encourage support from government. The Environment Agency had played a leading role in developing the evidence base. The organisation had already considered its own role in addressing environmental inequalities. Yet, it still sought leadership from Defra to develop this new area of policy, and promote its integration across government. So, it was evident from this project, that there are significant tensions between the Environment Agency's role in providing advice to government as a delivery body, and the extent to which it could lead on policy development. This perhaps reflects the organisation's sensitivity to its role, particularly during the Haskins Commission's review, which recommended the separation of the government's role in developing policy and its agencies' delivery functions (Haskins, 2003). It also highlighted the tensions in advocating changes in environmental policy, which do not yet reflect current operational practice by the organisation.

³⁴ NRU Forum (19 May 2004) 'How relevant is environmental inequality to neighbourhood renewal policies and programmes?' Eland House, London.

5. THE PROJECT'S IMPACT

In this section, I evaluate the impact of the project in achieving its three strategic objectives and highlight where the project has led to new policy framings – stage five of the action research process. At different stages of the process, my manager and I took time to reflect. Writing papers, such as this project record and papers for the International Geographer's Union Conference and International Sustainable Development Research Conference (Chalmers and Colvin, 2004; Chalmers, 2005b) also helped us evaluate the project's impact, and the strengths and weaknesses of our approach, which I will return to in section six. This evaluation was undertaken at the end of the project, following the publication of the UK Sustainable Development Strategy. Developments related to this project since April 2005 are reported in the postscript in section eight.



5.1 The challenge of assessing the project's impact

Assessing the project's impact on change both inside and outside the Environment Agency is complex. This is partly because of the wide range of interactions with other projects and stakeholders, and partly because of the other factors that may be at play. This evaluation focuses on change at a national policy level, and uses communications with national stakeholders as evidence of the project's impact. For example, comments from the Environment Agency's Directors on papers reporting progress at the end of each research/ policy inquiry cycle provide a useful indication of change at a senior policy level within the Environment Agency, see column one of

figure 5.1. This table summarises the progress at each stage against the project's three primary objectives:

- (i) to improve the Environment Agency's understanding of the relationship between environmental quality and social deprivation;
- (ii) to clarify the Environment Agency's role in addressing environmental inequalities;
- (iii) to ensure that other government policies and strategies promoting sustainable development) reflect the need to address environmental inequalities.

Endnotes are used to reference the outputs from this project, as evidence of its influence.

Figure 5.1: The impact of this project on the Environment Agency's understanding, the Environment Agency's policies and others' policies and strategies

	Environment Agency's understanding of relationships between environmental quality and social deprivation	Environment Agency policies address environmental inequalities	Others' policies and strategies address environmental inequalities
Start of stage 1: July 2002 Before starting the project.	Early analysis of environmental data sets showed correlations with social deprivation ⁱ	Organisation committed to environmental equality ⁱⁱ , but concerns remain about legitimacy of Environment Agency role ⁱⁱⁱ	Little recognition of environmental justice or environmental aspects of deprivation within government strategies ^{iv}
End of stage 1: Framing the questions and building support for the project (July 2002 – March 2003)	Interviews, literature review and stakeholder workshop identified the need for further research ^v , see steering group report in Annex 2.	Project helps Environment Agency recognise opportunities that this agenda presents for influencing government policy and planning system at local level to help improve and protect the environment ^{vi} , see briefing for Chairman and Directors in Annex 1.	Sustainable Development Commission, Environmental Justice Network and wider stakeholder calls for research and policy on environmental justice ^{vii} .
End of stage 2: Gathering the evidence (April 2003 - July 2003) ^{viii}	Empirical evidence gathered by project shows relationships between social deprivation and flooding, poor air quality and the location of IPC sites ^{ix} , see research report in Annex 3.	Staff agree that Environment Agency has moral duty, a statutory remit and duty as a public body for ensuring equitable delivery of environmental outcomes ^x	Worker-researcher involvement in ODPM 'Environmental Exclusion Review' starts to identify importance of environmental protection in neighbourhood renewal ^{xi} , see recommendations to ODPM in Annex 5.
End of stage 3: Making sense of the evidence and its implications for the Environment Agency and government policy (July 2003 – March 2004) ^{xii}	Project helps Environment Agency staff make connections between their practical knowledge of environmental inequalities, and the opportunities within theirs and others' work to address them ^{xiii} , see workshop report in Annex 4.	Project explores and develops opportunities for incremental change within Agency policy and process. Project facilitates agreement by Directors of framework for action ^{xiv} , but recognises little flexibility within current regulatory framework.	Project helps stakeholders make connections between key government agendas on neighbourhood renewal, sustainable development and the Aarhus Convention ^{xv} .
End of stage 4: Securing commitment that others' policies will reflect the need to address environmental inequalities (December 2003 – July 2004) ^{xvi}	National project stimulates Agency's Regional Strategic Units and Defra to commission wider analyses of environmental inequalities ^{xvii}	Environment Agency and worker-researcher play a key role in leading change and advocating solutions to government ^{xviii} .	ODPM recognises importance of environmental aspects of multiple deprivation ^{xix} , and cross government working group on environment and social justice established.
Stage 5: Negotiating new framings (July 2004 – September 2004)	Worker-researcher and manager reflect on project's research ^{xx} , and secure funding for future research	Project facilitates agreement of Environment Agency policy position on 'addressing environmental inequalities' (published in July 2004) ^{xxi} . See figure 4.12.	Addressing environmental inequalities as cross-government theme within UK Sustainable Development Strategy ^{xxii} .

ⁱ For example, analysis undertaken as part of urban assessment of England and Wales: Environment Agency (2002b). The Urban and Environment in England and Wales: A Detailed Assessment. Bristol: The Environment Agency.

ⁱⁱ Environment Agency (2000b). Achieving Environmental Equality – AGM Debate Highlights. Bristol: Environment Agency; and Environment Agency (2001a). An Environmental Vision: The Environment Agency's Contribution to Sustainable Development. Bristol: Environment Agency.

ⁱⁱⁱ Policy Steering Group (June 2002). Minutes of Policy Steering Group. Bristol: Environment Agency, unpublished.

^{iv} Environment Agency (2000a). National Strategy for Neighbourhood Renewal – A Framework for Consultation. Response from the Environment Agency. June 2000. Bristol: Environment Agency. Unpublished. Environment Agency (2001b). Communities First - The Way Forward. Consultation on the Proposed Policy Framework. Response from Environment Agency Wales. Jim Poole, 2001. Unpublished. Although commitments exist within: ODPN, Neighbourhood Renewal Unit (2003). Delivering Environmental Equity through Neighbourhood Renewal. London: The Stationery Office for the Office of the Deputy Prime Minister.

^v For example, see Walker, G., Mitchell, G., Fairburn, J. and Smith, G. (2003c). Environmental Quality and Social Deprivation. Phase I: A Review of Research and Analytical Methods. Research and Development Project Record 12615, Bristol: Environment Agency, pp.111; and Chalmers, H. (2003a). Environmental Equality Research, Policy and Action. Report on the First Meeting of the Environment Agency Environmental Equality Steering Group. The CREATE Centre, Bristol, 3 April 2003. Bristol: Environment Agency, pp.25 (unpublished) in Annex 2.

^{vi} Helen Chalmers and Peter Madden input to Blair, T. (24 February 2003). Speech on sustainable development. London: 10 Downing Street; and Colvin, J., Chalmers, H., Orr, P., Hughes, S. (February 2003). Contributing to joint action on poverty and environmental degradation – memo to the Chairman and Directors. Bristol: Environment Agency. Unpublished in Annex 1.

^{vii} 'Environmental Justice in the UK - After World Summit on Sustainable Development' workshop (18 December 2002) City Temple Conference Centre, Holborn Viaduct, London.

^{viii} Following completion of review of existing evidence and analysis of relationships between environmental quality and social deprivation by Walker et al (2003a-d), and before the internal Environment Agency workshop on Environmental Equality held on 14 July 2003.

^{ix} Walker, G., Mitchell, G., Fairburn, J. and Smith, G. (2003b). Environmental Quality and Social Deprivation. Technical Report. Research and Development Project Record 12615, Bristol: Environment Agency, pp.64 in Annex 3.

^x Chalmers, H. (2003b). Environmental Equality Research, Policy and Action. Report on the Environment Agency Environmental Equality Workshop, Aston Business School, Birmingham, 14 July 2003. Bristol: Environment Agency, pp.31 (unpublished).

^{vi} Helen Chalmers and John Colvin involvement in project board for NRU Environmental Exclusion Review (Brook Lyndhurst, 2004); and Environment Agency (2003b). Response to the Office of the Deputy Prime Minister Consultation: Updating the English Indices of Deprivation 2000, 14 November 2003. Bristol: Environment Agency in Annex 5.

^{vii} Chalmers, H. and Madden, P. (26 November 2003). Addressing Environmental Inequalities: Paper to the Environment Agency's Policy Steering Group. Bristol: Environment Agency (unpublished) in Annex 6.

^{viii} Chalmers, H. (2003b). Environmental Equality Research, Policy and Action. Report on the Environment Agency Environmental Equality Workshop, Aston Business School, Birmingham, 14 July 2003. Bristol: Environment Agency, pp.31 (unpublished) in Annex 4.

^{ix} Chalmers, H. and Madden, P. (26 November 2003). Addressing environmental inequalities: Paper to the Environment Agency's Policy Steering Group. Bristol: Environment Agency (unpublished).

^x Chalmers, H. (2003c). Environmental Equality Research, Policy and Action. Report on the Second Meeting of the Environment Agency Environmental Equality Steering Group, The Meeting Place, 153 Drummond Street, London, 21 November 2003. Bristol: Environment Agency, pp.8 (unpublished); and DEFRA (2004a). Taking it On: Developing the UK Sustainable Development Strategy Together, a Consultation Paper. London: The Stationery Office for the Department of the Environment, Food and Rural Affairs in Annex 7.

^{xi} Chalmers, H. and Madden, P. (16 August 2004). Addressing environmental inequalities: Paper to the Environment Agency's Policy Steering Group. Bristol: Environment Agency (unpublished) in Annex 9.

^{xii} Lucas, K., Walker, G., Eames, M., Fay, H. and Poustie, M. (2004). Environment and Social Justice: Rapid Research and Evidence Review. London: Sustainable Development Research Network, unpublished. September 2004.

^{xiii} Madden, P. (15 January 2004). 'Escape from Pollutionville: Peter Madden on refocusing regeneration to prevent the poor being trapped in the worst environments'. The Guardian, Society, p.13. Environment Agency (August 2004d). Response to the DEFRA Consultation, "Taking it On: developing the UK Sustainable Development strategy together". Bristol: Environment Agency; and HM Government (2005). Securing the Future – Delivering the UK Sustainable Development Strategy. London: The Stationery Office for Defra; Chalmers, H. and Gilder, P. (2004). Air Quality and Social Deprivation. A paper to the National Society for Clean Air Spring Workshop, 22-23 April 2004, Abingdon in Annex 8; and Skinner, A. (2004). Regulating for the environment and social justice. Presentation to the cross-governmental Environment & Social Justice Working Group, 20 September 2004, London in Annex 10.

^{xiv} ODPM, Neighbourhood Renewal Unit (2004). The English Indices of Deprivation 2004. London: The Stationery Office for the Office of the Deputy Prime Minister; and Chalmers, H. (2004b). Environmental Inequalities: presentation to the Neighbourhood Renewal Unit Forum: How relevant is environmental inequality to neighbourhood renewal policies and programmes? 19 May 2004, Eland House, London. Bristol: Environment Agency (unpublished).

- ^{xx} Chalmers, H. and Colvin, J. (2004). Addressing Environmental Inequalities in UK policy – an Action Research Perspective. Paper presented to the International Geographers Union Conference, 19 August 2004, Glasgow. Bristol: Environment Agency published in Local Environment. Volume 10 (4): 333 – 360. London: Routledge.
- Chalmers, H. (2005). Addressing environmental inequalities through UK research and policy. Paper presented to the 11th Annual International Sustainable Development Research Conference, 6-8 June 2005, Helsinki, Finland published in European Environment. Volume 15 (6). London: John Wiley & Sons, Ltd and ERP Environment; and (this doctoral project report) Chalmers, H. (2006). Developing the Environment Agency's policy position on 'addressing environmental inequalities'. London: National Centre for Work Based Learning Partnerships, Middlesex University.
- ^{xxi} Environment Agency (2004e). Position Statement. Addressing Environmental Inequalities. Bristol: Environment Agency.
- ^{xxii} Defra (March 2005d). Securing the Future: Delivering the UK Sustainable Development Strategy. London: The Stationery Office; and Harman, J. (7 March 2005). Tackling Environmental Inequalities. Environment Agency response to the UK Strategy for Sustainable Development commitments for addressing environmental inequalities. Speech by Sir John Harman, Environment Agency Chairman at the launch of the UK Sustainable Development Strategy, London. Written by Peter Madden and Helen Chalmers in Annex 11.

5.2 The impact on the Environment Agency's understanding of relationship between environmental quality and social deprivation

The Environment Agency's understanding of environmental inequalities has developed considerably over the course of the project, particularly in relation to its regulatory duties: flood risk management, air quality policy and IPC regulation. On starting the project in October 2002, the empirical evidence base was limited to a small number of environmental issues, with little consideration of the causal mechanisms and cumulative impacts of environmental and social inequalities. The Directors' response to the analysis presented in the Environment Agency's publication *Our Urban Future* in 2002 indicated that while there was clear acceptance of the correlations, there was also considerable uncertainty about the relative impacts of flooding and IPC sites on deprived communities; and caution about commissioning further research³⁵.

The research undertaken as part of this project by Walker et al (2003b) provided a more sophisticated analysis, and has enabled a fuller awareness of current research, as well as proving useful in stimulating wider discussion about environmental inequalities. However it only reveals the proximity of these environmental hazards, rather than the level or exposure of risk experienced by communities. There is still further work to be done to understand flood risk and waste management, as well as other issues of priority, such as water quality. In addition, we still do not understand the cumulative impact of multiple environmental hazards and their effect on people who are already socially and economically disadvantaged.

But perhaps more significantly, the Environment Agency's knowledge about these relationships is now grounded by some practical knowledge about the implications for the Environment Agency and other players. Participatory workshops and collaborative inquiry with the organisation's staff have helped to develop diverse understandings of how this knowledge might support, but also challenge their current roles, for example, through regional planning and policy relating to improving air quality.

³⁵ Minutes of Policy Steering Group, 6 June 2002. Environment Agency, Millbank Tower, London.

The Environment Agency has now publicly advocated the need for further research in this area. In the press release to launch the report by Walker et al (2003), the Chief Executive made recommendations for 'further research in this area, together with a joined-up approach to addressing environmental inequalities alongside social and economic problems in deprived areas' (in Environment Agency, 2004). This was echoed by the Environment Agency through other fora, such as its response to the EU's consultation on Health and Environment Strategy, in which the Environment Agency called for more research on the health consequences of environmental pollutants, and particularly on children and other vulnerable groups' (Hayes, 2004). And most notably, in its position statement on addressing environmental inequalities, the organisation stated that:

'more research is needed to understand the cumulative impact of environmental inequalities on people's health and quality of life in both rural and urban areas. A better understanding is needed of where existing mechanisms are reinforcing environmental inequalities; and how government and others can best respond' (Environment Agency, 2004e).

The Environment Agency's research has gained considerable political attention, is valued by government, and is shaping further research in this area. For example, the organisation's calls for more research on environmental inequalities, could be said to have had a significant influence on Defra's decision to commission the Sustainable Development Research Network to undertake a rapid review of research and evidence of environmental inequalities (Lucas et al, 2004). This review, which also examined their causation, and the policy interventions designed to address them is the culmination of research by others, such as Friends of the Earth, Capacity Global and the Sustainable Development Commission, the Joseph Rowntree Foundation.

At the same time, this project has prompted invitations for increased collaboration between the Environment Agency and Defra in understanding the relationships between air quality and social deprivation, and in the development of a sub-

catchment case study on flooding and deprivation³⁶. Strong links with the Environment Agency's Human Health Team have also opened up opportunities to influence national research and development programmes, such as Defra's Waste and Resources Research and Development Strategy³⁷. Within the organisation, the project has supported research by the North West Region (Midgely et al, 2005), and also prompted the Environment Agency's other regional strategic units to initiate their own regional studies of environmental inequalities, for example in the North East, Thames and South West regions³⁸.

Encouragingly, the Environment Agency's Directors now shown much greater conviction in the value and political attention being given to this work. The Environment Agency is committed itself to playing a key role in undertaking further research in this area. In December 2003 and later in July 2004, the Directors called for more research. Firstly, they wanted to understand whether the location of new waste sites are as closely linked to deprived neighbourhoods as existing sites. Secondly, there was interest in undertaking two local case studies to understand, and to pilot how the Environment Agency could address environmental inequalities in two local areas (PSG, 2003). At the cross-government workshop on environment and social justice in March 2004, the Head of Environmental Policy stated that the Environment Agency would help develop the evidence base to support government policy for addressing environmental inequalities (Woodward and Lloyd, 2004). This role has been formalised through a position statement, in which the Environment Agency is committed to continuing to carry out research to build on this knowledge base. In particular, the Directors agreed that:

'[the Environment Agency] will demonstrate [its] contribution to tackling environmental inequalities by developing the evidence base with others to understand environmental inequalities and the most effective ways of tackling them

³⁶ Notes of meeting between the Agency and Defra (19 December 2003) on the Draft Emerging Defra Flood Strategy and Integrated Policy Appraisal, London.

³⁷ Email comments from Helen Chalmers to the Human Health Team and Defra Re: Defra - Waste and Resources R&D Strategy (1 September 2004)

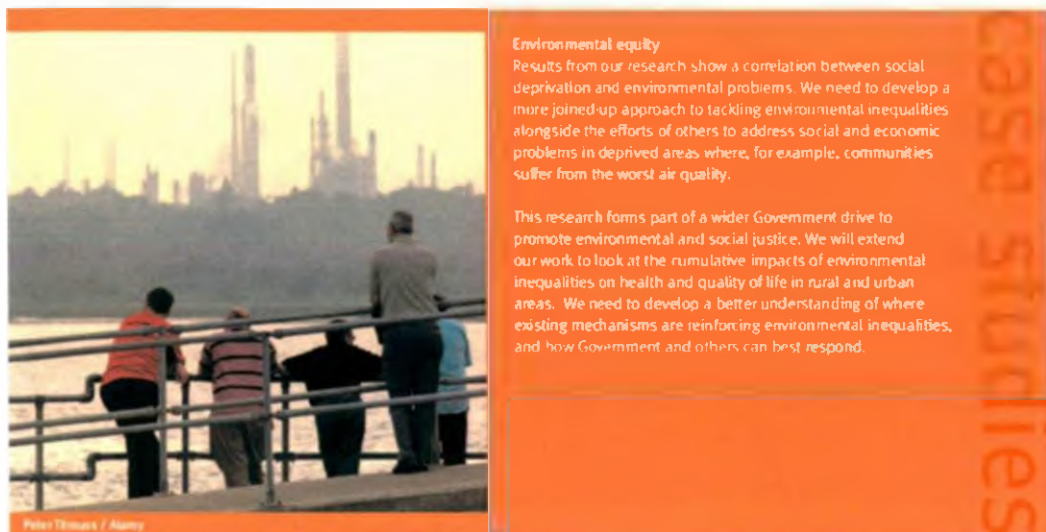
³⁸ Verbal correspondence with North East Strategic Environmental Planner; Thames Region plan to update a previous study of the Lower Lea Valley; analysis of environmental inequalities undertaken by South West RSU to support the South West Observatory's 2nd Annual Conference 'Sharing in the Region's Prosperity', 5 March 2004, Bristol.

(e.g. with new research on flood risk, waste, and case studies in local areas)'

(Chalmers and Madden, 2004).

This commitment is reflected in the Environment Agency's new Science Strategy, in which environmental inequalities features as an example of good practice (Environment Agency, 2004h), see figure 5.2. The success of this research project is also demonstrated by the extension of my post as Social Policy Advisor and through the provision of funding for further research into environmental inequalities during 2005-2006.

Figure 5.2: Science for environmental equity valued and promoted by the Environment Agency



Source: Environment Agency (2005) *Solving Environmental Problems with Science. Science Strategy 2004 Onwards*. Bristol: Environment Agency.

5.3 The impact on the Environment Agency's policies and commitment to address environmental inequalities

Considerable progress has been made since the start of this project in agreeing with Directors and wider staff the role that the Environment Agency should play and how it could contribute to addressing environmental inequalities. Overall, there has been a sizeable shift in the organisation's awareness of evidence of environmental inequalities, towards active promotion of change within the Environment Agency and government policy. In June 2002, the Directors questioned whether the fact that poor environmental quality correlated with deprived areas warranted particular

attention and whether the Environment Agency could do anything differently within its current legislative framework. In July 2004, they agreed an external-facing position statement which advocated solutions to others and stated the Environment Agency's commitment to 'do what we can to address environmental inequalities and ensure that we do not contribute to further inequalities in the future' (Environment Agency, 2004f).

The most significant change has been in the increase in the staff's awareness of the need to address environmental inequalities. This is evident in their willingness to explore how they can make changes in their own work, for example, in working with regional government, and in framing the organisation's contribution to other areas of national policy, such as flood risk and air quality, as well as human health.

In flood risk management, there is increased recognition of the need to take account of the intangible health impacts of flooding on different groups (Defra, 2004b). The cross-government strategy *Making Space for Water* signalled a sizeable shift in the government's approach towards a more flexible approach to prioritisation. The strategy now outlines a vision of flood and coastal erosion risk management, in which risk management tools will be improved in line with the government's policies on social justice (page 20), and flood risk management measures will take account of the environmental and social consequences of flooding (page 19) (Defra, 2005a).

In a paper to the Environment Agency's Board, the Director of Water Management recommended that Board members promote 'a shift to multi-criteria analysis and the ability to more effectively include social, economic and environmental drivers in strategy and project appraisal'; and secondly 'indicative standards of defence to assist in prioritising spend and to give clarity to the public' (King, 2004). Much of this can be accredited to earlier Environment Agency and Defra research, and work by Flood Risk Management policy advisors to broaden the integrated appraisal criteria used to inform risk assessment and project appraisal. But it can also be argued that this project and the work of the wider Social Policy Team has helped add weight to their justification. The recent appointment of a new Flood Events Manager in May 2004 also signalled the increased importance given to managing the social

consequences of flooding, and how these can be built into the decision-making upstream.

There are also signs that the project might, with time make an impact on the Environment Agency's core policies and processes for regulating IPC sites. Despite earlier reservations about the Environment Agency's capacity to address the spatial distribution and social impacts of IPC sites being limited by existing legislation, the initial interest shown by the Regulatory Policy team in environmental inequalities has been encouraging. The work led by this project has led to further discussions initiated by the Process Industries Regulatory policy team about stakeholder engagement in the assessment of the social aspects of risk³⁹. In a presentation to the cross-government Environment and Social Justice working group in September 2004, the Director of Environmental Protection stated:

"we [the Agency] have the capacity to develop this agenda on social equity ... the government needs to articulate what is expected and provide the toolkits and resources to make it happen"(Skinner, 2004).

Delivering the Environment Agency's commitments to 'scrutinis[e] our approach to modern regulation and flood risk management to help reduce the risks to deprived communities' will require a significant further investment in action research and policy development. There are certainly opportunities for building on the ideas presented by staff in PIR and the Areas, where IPPC regulation could help reduce environmental risks in deprived areas.

Embedding environmental equality across the Environment Agency's policies and processes will also require continued leadership from senior policy managers, the Chief Executive and the Chairman. Both Baroness Barbara Young of Old Scone and Sir John Harman clearly recognise the opportunities for using the government's interest in inequalities for highlighting the environmental dimensions of disadvantage, and the role the Environment Agency should play. Speaking at the Health of the People conference, Baroness Barbara Young of Old Scone said:

³⁹ Meetings with the Process Industries Regulation Policy Team on 24 May 2004 and 2 April 2004.

"The Agency is considering ways in which it can take account of impacts of its activities on environmental inequalities...In many cases, the Agency will not be able to tackle environmental injustices through the regulatory provisions currently available but will need to work within its wider role as an influential advisor and informative communicator both to the government and local communities" (Young, 2004).

And to the Environmental Policy Unit and senior policy managers, the Chief Executive said that:

"we've got to do more to join up the environment with social progress, and make sure that the people in the most deprived areas don't get the crappy environments"⁴⁰.

Looking to the future, there are some clear opportunities for demonstrating the importance of these issues to the organisation, and integrating environmental equity into the Agency's work. For example, whilst the Environment Agency's *Environmental Vision* states the organisation's earlier commitments to environmental equality, this is not reflected in its current Corporate Strategy. The forthcoming review of the Environment Agency's Corporate Strategy *Making it Happen* provides an opportunity for measuring the organisation's contribution to a better quality of life beyond the number of fishing rod licences issued.

5.4 The impact on others' strategies and their recognition of the need to address environmental inequalities

The project has been highly influential in gaining wider recognition for the environmental dimensions of disadvantage and the need to address environmental inequalities. Firstly, the project has positioned the Environment Agency as a key player in shaping the debate around environmental inequalities. Defra have frequently called upon my senior managers and I to advise and help facilitate

discussions across government on environment and social justice, "*because of the pioneering work the Agency has done in this area*"⁴⁰. This is indicative of the more proactive role that the organisation has begun to take in shaping government policy. For example, in a recent poll of senior civil servants in contact with Environment Agency policy advisors, seventy six per cent agreed that the Environment Agency has a major influence on government policy, compared with only forty three per cent in 2003 (Test Research, 2004).

Secondly, we can see significant changes in other areas of government policy where this project has focused its efforts. The Index of Multiple Deprivation 2004, used to identify and target spending in the eighty eight most deprived areas in England, now includes a 'living environment domain' and takes account of air quality, traffic accidents, housing quality and houses without central heating (ODPM, 2004). The hope is that the revised IMD will help ensure better recognition of the environmental dimensions of disadvantage and mechanisms to address them through neighbourhood renewal policy and practice⁴². At the same time, Environment Agency Wales is currently providing extensive support to the development of the new Welsh IMD, which is expected to feature a wider range of environmental indicators⁴³.

The project's work with the Neighbourhood Renewal Unit and persistent support for and contribution to the NRU's Environmental Exclusion Review has helped lay the foundations for future change. Environmental protection is now one of the three core themes for the NRU's review of environmental exclusion, and is supported as a key priority area in tackling multiple deprivation by its senior policy managers. Helping the NRU to develop its understanding of these issues has also led to future opportunities for the Environment Agency to work with the NRU. Collaboration between the Environment Agency, Defra and the NRU has also helped position the

⁴⁰ Baroness Barbara Young of Old Scone, Environment Agency Chief Executive in her after dinner speech at the Environmental Policy Unit Away Day, 21 September 2004, Oxford.

⁴¹ Sustainable Development Advisor. Defra speaking at the Environmental Equality Steering Group (21 November 2003).

⁴² However, the new Index will not be introduced until 2006 at the earliest, when the £800m neighbourhood renewal fund for the 88 most deprived neighbourhoods runs out.

⁴³ Email and verbal correspondence with Environment Agency Wales, and National Assembly for Wales policy and data information advisors.

NRU as a key player in developing the government's evidence and policy on environment and social justice. However, this commitment has yet to be demonstrated through the implementation of the recommendations of their *Environmental Exclusion Review*, and through the adequate integration of environmental protection and improvement into strategies and programmes to tackle multiple deprivation, and guidance to Local Strategic Partnerships.

Thirdly, we have already seen increased recognition of the environmental determinants of health within the government's action plan for tackling health inequalities (Department of Health, 2003) and emphasis on environmental justice as a core principle of *Building Civil Renewal* (Home Office, 2003). This is due in part to a wider agenda promoting greater emphasis on policy integration and sustainable development. However these have still to reflect the Environment Agency's core environmental concerns.

Fourthly, the highly influential IPPR report (sponsored by the Environment Agency's Policy Development and Promotion team) gained support from government ministers. In her foreword to the report, the Secretary of State for the Environment stated:

'this report helps us move beyond this view ['that environment and social goals may be mutually exclusive or even in conflict'] to one which identifies many positive synergies between the two at all levels. I hope it provokes many more people into considering how they can take forward its conclusions' (Foley, 2004).

At its launch in May 2004, Senior Policy Advisor at the Downing Street Policy Unit stated that the government's third term provided a "deepening opportunity" for sustainability and social justice. Timed to coincide with the government's Spending Review, the report and its recommendations are reflected in some of the subsequent commitments by Her Majesty's Treasury and revised Public Service Agreements (see figure 5.3).

Figure 5.3: Commitments to sustainability and social justice in the government's spending review 2004

- implement agreed reforms to the Common Agricultural Policy, drive forward further reform, and take forward modernisation of rural delivery following the Haskins review;
- further action to tackle climate change and make progress towards the domestic target of reducing carbon dioxide emissions by 20 per cent by 2010. Climate change will be a key theme of the UK's EU and G8 Presidencies in 2005;
- £95 million higher spending on the Warm Front Programme in 2004-05 to improve energy efficiency of homes and reduce fuel poverty;
- greater local and regional involvement in investment choices to create a more integrated system of transport, spatial and economic planning and implementation;
- enhanced focus on 'liveability' and a national target to make local public spaces cleaner, safer and greener;
- continued support for neighbourhood renewal of £525 million a year to 2007-8, and a refined PSA target to narrow the gap between the most deprived areas and the rest of the country (including on liveability)
- Improve air quality by meeting the Air Quality Strategy targets for carbon monoxide, lead, nitrogen dioxide, particles, sulphur dioxide, benzene and 1-3 butadiene. DfT and Defra.

Source: Her Majesty's Treasury (2004). 2004 Spending Review: New Public Spending Plans 2005-2008. Stability, Security and Opportunity for All: Investing for Britain's Long-Term Future.

Further encouragement on progressing its recommendations was also given by Environment Minister, Elliot Morley MP, who stated that he would be "happy to meet with the main contributors to the report to make the recommendations into real policy and action". This led to his support for a seminar on 18 October 2004 to decide government priorities for delivering environment and social justice⁴⁴.

Lastly, one of the most important outcomes of this project has been its influence on the UK Strategy for Sustainable Development, and its focus on addressing environmental inequalities (HM Government, 2004a). In her opening speech to the Sustainable Development Research Network conference in September 2004, Defra's Head of Strategy and Sustainable Development said:

"the Environment and Social Justice theme has come about very much from the work of the Environment Agency...which identified that the poorest people tend to live in the worst environments" (Rutter, 2004).

⁴⁴ Indicated in verbal communication with Sustainable Development Advisor, Defra SDU, 8 September 2004.

Defra’s subsequent championing of this theme has led to cross-government and ministerial support for the development of strategic policy interventions for environment and social justice, and for tackling environmental inequalities. In the new UK Sustainable Development Strategy, the government is committed to giving ‘a new focus to tackling environmental inequalities’ (HM Government, 2005:2). The Strategy *Securing the Future* outlines a number of commitments which broadly match the solutions that this project has helped identify, and which the Environment Agency advocates in its position statement. These commitments to addressing environmental inequalities are summarised in figure 5.4.

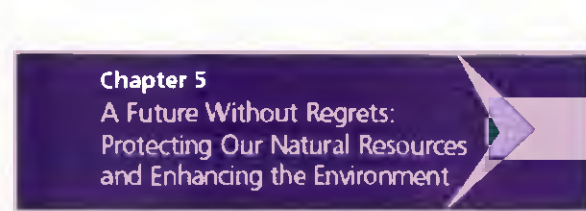
Figure 5.4: Commitments to addressing environmental inequalities in the UK Sustainable Development Strategy

A new focus to tackling environmental inequalities in the Prime Minister’s Foreword, pages 3-4



We are increasingly aware of the need to make care for the environment an integral part of policy making from the start, rather than dealing with the consequences of neglect down the line. We need to regard the local environment as a major public service (like the NHS or education) which benefits us every day. Looked at this way, it is clear why policies to promote better quality environments also have the capacity to have long-term social and economic benefits. Often those people who are most economically and socially disadvantaged also live in degraded environments with fewer jobs, unsafe and ugly streets. Our goals are a strong economy, and decent homes in places with clean, safe and green public spaces, where people are able to lead healthy lives, and enjoy the environment around them. So our new strategy contains not only a commitment to create sustainable communities but a commitment to give a new focus to tackling environmental inequalities as well.

Tackling environmental inequalities as a foundation for protecting natural resources, page 98



4. Tackling degraded resources and environmental inequalities

As well as tackling the pressures on the environment today, we need to address the negative effects on plants and animals, air, water and soil quality as a result of human activities dating as far back as the beginning of the industrial revolution. This inheritance of degraded resources has led to social and economic deprivation, as well as a poorer environment and ill health. Improving the local environment is therefore often a starting point for wider regeneration activities.

- ▶ The Government will work with stakeholders to develop a clear vision and coherent approach for the UK to the protection and enhancement of natural resources by the end of 2005

There are three broad foundations on which we will build this new approach to protecting natural resources:

- ▶ developing the evidence base
- ▶ integrating policy, and
- ▶ tackling degraded resources and environmental inequalities.

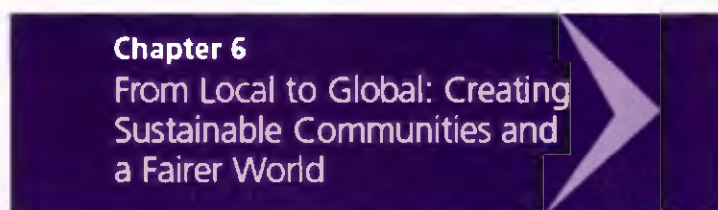
Minimum standards for a decent and healthy environment, page 111

Globally and within the UK, deprived and excluded communities are affected disproportionately by degraded natural resources and their associated risks. Minimum standards for a decent and healthy environment are set by adopting and enforcing the international, European and national policy and regulatory frameworks. People will be able to see what they can expect from their environment and who is responsible for ensuring it is of a high quality. They can also help report failures to meet these standards.

- ▶ The Government will bring this information together in an integrated framework and publish details of this at www.sustainable-development.gov.uk

Regulatory tools and civil penalties, page 132

- ▶ The Government will collaborate with the Environment Agency and others to look at proposals to develop a scheme of civil penalties for certain environmental offences to ensure that we have more effective means of tackling environmental pollution and environmental inequalities



Further research on the causes of environmental inequality and measures to tackle them, page 133

The Sustainable Development Research Network report²⁵, commissioned for this Strategy, backed by evidence from Scotland and an Environment Agency report,²⁶ highlights another increasingly important area of inequality:

"Poor local environmental quality and differing ease of access to environmental goods and services have a detrimental effect on the quality of life experienced by deprived communities and socially excluded groups and can reinforce deprivation if not tackled alongside access to employment, health and tackling crime."

The research draws together the emerging evidence for the cause and impact of environmental inequalities for twenty one issues, such as graffiti and vandalism, access to transport services, and air pollution. It shows how complex and varied the patterns of environmental inequality are, and demonstrates that it is a real problem within the UK affecting the most deprived communities. The research also draws attention to the need for further work on the causes, cost and effectiveness of policy interventions.

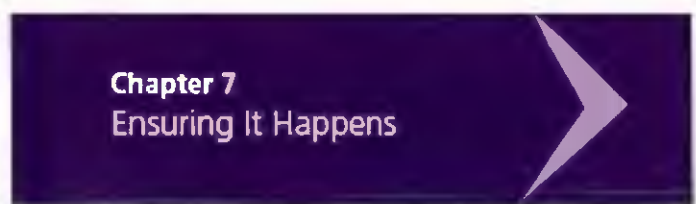
From evaluations of Community Strategies, the Government was already aware that these were key issues in deprived areas so it has established a new floor target to ensure cleaner, safer and greener public spaces and improve the quality of the built environment in deprived areas and across the country by 2008. Programmes within the Cleaner, Safer, Greener Communities priorities²⁷ tackle these issues, but we need more research on which approaches to tackling environmental inequality are likely to be the most effective.²⁸

- ▶ The Government will fund further research on the causes of environmental inequality and the effectiveness of measures to tackle it in order to establish the best ways to tackle these issues in communities

Focusing action on the poorest quality local environments, page 134

But across the range of local environmental issues, we need to ensure that action is focussed on the areas most in need. We already have a comprehensive system of statutory designations which allows us to identify and protect the most fragile natural environments, but we do not have a system for identifying the poorest quality local environments which need most enhancement to improve people’s health and quality of life. The Government plans to put this system in place and use that as a basis for encouraging all local service providers through the local authorities and LSPs to focus on these areas, in consultation with the communities who live there, for example through Local Area Agreements.

- ▶ While we carry out further research to help identify the areas with the worst local environment, the Government will in the short term focus on improving the environment in the areas already identified as most deprived by the Index of Multiple Deprivation.



Taking account of environmental inequalities in future targets and resource allocation, page 155

- ▶ This strategy will be used as a basis for integrating sustainable development into the 2006 Spending Review and future spending rounds which set PSA targets and allocate resources

Appraising policy for distributional impacts of deprived areas, social groups and the environment, page 155

- ▶ Ensure that appraisal of policy proposals takes account of their local and distributional impact to avoid adverse impacts on the most deprived areas and social groups
- ▶ The Government will ensure that this message is reinforced at all levels across departments. The Government will also ensure that new case study guidance incorporates the latest thinking and techniques particularly on how to evaluate less tangible costs and benefits, such as the impact in different parts of the country and for different social groups on health, the environment, access to services, land use and natural resources so that issues of environmental inequality are addressed.

Developing new indicators of environmental equality, page 174

60. Environmental equality*: (environmental measures to be developed)	ODPM PSA 8 Lead the delivery of cleaner, safer and greener public spaces and improvement of the quality of the built environment in deprived areas and across the country with measurable improvement by 2008
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Source: Her Majesty’s Government (2005d). *Securing the Future – delivering the UK Sustainable Development Strategy*. London: The Stationery Office HM Government.

The Environment Agency's Chairman, Sir John Harman was asked to respond to these commitments at the launch of the UK Sustainable Development Strategy on 7 March 2005. In his speech (written by the worker researcher and Head of Environmental Policy), Sir John Harman welcomed the government's commitments, and called for more work to tackle environmental inequalities through programmes designed to tackle multiple disadvantage and health inequalities, regional and local planning, see Annex 11 (Harman, 2005).

5.5 The impact on my personal and professional development

Undertaking this work-based doctorate and the research and policy inquiry into environmental inequalities has rewarded me with rich learning experiences. It has enabled me to develop my understanding of sustainable development, together with invaluable personal and technical skills that will better equip me for the future in providing leadership for sustainable development.

The project has given me a unique insight into the Environment Agency as an organisation, and in its role as champion of the environment. I was ideally placed in my position within the Environmental Policy unit to experience and understand the complex and challenging nature of developing, embedding and advocating cross-cutting policy. As an employee, policy officer and participant in the organisation, as well as a researcher, reflective practitioner and observer, I have gained different perspectives of the organisation and the processes in which I was engaged. For these reasons, I believe that the doctorate provides valuable opportunities both for the individual's professional development and for the organisation, in harnessing an agent for change and someone who can provide an informed external view on the organisation.

The project has considerably enhanced my existing understanding of natural environmental processes with more technical and political knowledge of environmental policy areas, such as fluvial and coastal flooding, air quality and waste management. I have also learned about environmental regulation and policy instruments such as standards, risk assessment, permitting and policy appraisal, and their role in effecting procedural and substantive equity. As a result, I now have a

much wider appreciation of the operational mechanisms and challenges of delivering sustainable development.

At the same time, my experiential knowledge of sustainable development has been broadened by my involvement in areas of social policy such as neighbourhood renewal; and through my investigation and dialogue with others into equality and justice. To some extent, the project has reinforced my belief in environmental justice, and my conviction to challenge inequitable processes. The views of others have frequently forced me to reflect on my self, behaviour and personal values.

Managing and leading this project has strengthened my project management, research and policy development skills. Use of an action research and adaptive management approach has often proved challenging to my natural propensity for linear and detailed planning, and has tested my ability to be more reflective in my practice. I have become adept at communicating with – and to – different stakeholders and audiences, through written (e.g. reports, speeches, briefings) and verbal presentations. Indeed, one of the most valuable lessons that I have learned is that people's views and behaviour are not changed by more information, but by meaning and its value in increasing their knowledge and capacity to act.

Working within a team, with senior managers and in influencing government officials has strengthened my interpersonal skills, confidence and competency in negotiating and advocacy. Overall, I have become more politically and socially astute with a greater capability for creating organisational change for sustainable development.

6. CONCLUSIONS AND EVALUATION OF APPROACH

6.1 Conclusions

This project has helped establish that while the quality of the environment is generally improving, the most socially and economically deprived communities tend to live in the worst environments. For example, those living in the most deprived wards in England experience the worst air quality, are most likely to live next to industrial sites and are most likely to live in tidal floodplains. In Wales, the picture is very different. Air pollution is generally better, the location of industrial sites show some bias towards affluent areas, and the link between flooding and deprivation is less clear.

The Environment Agency's role is to contribute to a better quality of life for everyone, by improving and protecting the environment and whatever their background and wherever they live. To inform its approach, the Environment Agency carries out research on environmental inequalities and works with others to understand the most effective ways of tackling them. It takes account of the social and economic impacts of its work whenever possible and includes the interests of disadvantaged communities in its work. The Environment Agency advises on the environmental impacts of planning decisions, and advises government on environmental inequality.

The Environment Agency is committed to doing what it can to address environmental inequalities and will ensure that it does not contribute to inequalities in the future. It will undertake further research on environmental inequalities and scrutinise its approach to modern regulation and flood risk management. It will carry out Strategic Environmental Assessment to assess the impact of its plans and programmes on people, and continue to provide information, and support processes that help people to make better decisions about their environment.

Work is also needed by government, business and society to address environmental inequalities at a national, regional and local level. In particular, changes can be made:

- to gain a better understanding of environmental inequalities and the most effective ways of addressing them;
- by government policy to promote a reduction in environmental inequalities;
- by government to address environmental inequalities through tackling disadvantage;
- by regional and local planning to prevent further environmental inequalities;
- to ensure that communities supported and involved in decisions that affect their local environment (Environment Agency, 2004f).

6.2 Evaluating the approach

In previous sections I have provided a critical analysis of the action research and policy inquiry (section four) and its impact on delivering the project's objectives (section five). Building on this assessment, I am now able to reflect on the strengths and weaknesses of the action research approach and its characteristics described in section three. This evaluation adds a further and important finding of the research and contributes to the recommendations set out in section 7.

To evaluate the approach taken for this project, I will use the validity characteristics of action research (described in figure 3.1) rather than the notions of reliability and validity used in positivist research. The latter are unsuitable measures for an action research project, which cannot be replicated because of the unique social and political context in which it was developed, or validated by generalised findings. More appropriate are the notions of ontological and catalytic authenticity described by Bryman (2001). These refer to whether the research has helped its participants understand their own environment and the degree to which the research acts as an impetus for social action. So, instead I will ask 'what lessons can we learn from this project and its approach for developing effective policy and action for tackling environmental inequalities?'

6.3 Worthwhile purposes

Throughout the research inquiry, external stakeholders and Environment Agency staff continued to test our assumptions about the extent to which this research was

worthwhile, and to whom. It was clear from these discussions, that the underlying goal of this research was to address environmental inequalities and improve the environment and quality of life for everyone, but particularly those people who are already deprived. In achieving this, those involved also identified potential benefits for the Environment Agency being able to persuade others to deliver environmental benefits through social policies, for instance in delivering neighbourhood renewal. At the same time, its staff identified the value of the project in helping the Environment Agency strengthen its contribution to sustainable development.

Because of my role within the Environment Agency, this project was primarily concerned with creating change through policy development. The project helped facilitate considerable change in awareness about the problem, and some of the solutions, as well as managing to create some of the conditions necessary for future policy change. For example, the importance given to addressing environmental inequalities within the new UK Sustainable Development Strategy should provide a framework for change at an international, national, regional and local level.

Within the Environment Agency, this research project has helped develop greater awareness within the organisation and its staff, and identify ways in which it can address environmental inequalities. Although this strategy has proved successful, in a climate of rapidly changing political agendas and within a dominant policy development model of 'develop, advocate, and move on [to the next policy priority]', little importance is given to embedding change within the organisation. Whilst the Environment Agency's senior management seem convinced by the value of pursuing change within government policy, there is still a great deal to do in demonstrating the value of taking social deprivation and equity into account in environmental (and the Environment Agency's) decision-making. We have still to see how these values and policy commitments will affect the ways in which the Environment Agency will work, where it focuses its resources, and how it can deliver more sustainable outcomes on the ground.

As Chesterton has highlighted, systematic improvements in public services only occur when we integrate policy-making with practical action on the ground – 'ending the artificial separation between thinking and doing' (Chesterton, 2002 quoted in

Oakley, 2003). However, there is a danger that the increasing separation between 'policy' and 'process' within the Environment Agency, and in the wider delivery of rural and urban development will exacerbate rather than address this separation. We have yet to see whether these changes in national policy will effect any change on the ground. As the body responsible for reporting on the state of the environment, the Environment Agency could play a key role in ensuring that these policy commitments translate into improvements in the quality of the environment in deprived areas.

6.4 Practical knowing

The change that this project has helped create has depended largely on the practical knowledge of the users of the research. The project drew heavily on the knowledge of researchers, policy makers and the Environment Agency's operational staff about the relationships between environmental quality and social deprivation, and the changes needed to address them - what works and what does not. At the same time, we worked with them to develop and help them use this new knowledge. Co-production of knowledge with citizens, for example through policy making, and environmental monitoring will enable the public to be better involved in improving and protecting the environment, and serve to honour environmental rights, as well as encourage environmental citizenship (Barnett et al, 2004).

In particular, Environment Agency staff and other practitioners played a critical role in helping to make sense of, and attach meaning to, the abstract picture presented by the national statistical analysis. However, while considerable efforts were made to gather such evidence, it remains considerably undervalued within the Environment Agency in comparison to 'hard science' such as quantitative and scientific analysis. The quantitative analysis provided a useful tool for generating discussion, but its technical approach highlighted the limitations of the Environment Agency's data in representing the issues of importance to deprived communities, and the complex web of causes and the social construction of risk.

At the same time, the project could have benefited greatly from learning more from the practical experience of communities and practitioners at a local area level. The

project failed to capture this knowledge, and that of some of those essential to implementing change at a local level. For instance, the project failed to draw on the knowledge of local planning authorities who determine the location of environmental hazards. More work is needed to value this type of knowledge within national policy development.

6.5 Many ways of knowing

These different perspectives are critical to developing robust research and policy that is owned by all stakeholders. Throughout this inquiry, we have tried to engage a wide variety of Environment Agency staff and external stakeholders. However, in order to build support for this work at the beginning of the process, with a few exceptions, those involved were often existing allies, or with a keen interest in progressing this agenda. While this was useful in building leadership and support for the project, we failed to engage with those both inside and outside the organisation who challenged our ideas. Often the Environment Agency retreats by relying on its own expertise, rather than risk opening up the process to new ideas, styles of management and seeing conflict with stakeholders as part of the process of building understanding. Experiential knowledge from different perspectives could have more strongly challenged our assumptions and the often dominant empirical and rational epistemologies used by the 'experts', scientists and policy makers to frame the questions. In particular, it would have been valuable to draw on the experience of communities who have experienced environmental inequalities first hand.

For example, in Scotland, where environmental justice has become a more broadly supported political narrative, community representatives and individuals have been invited to share their experiences of environmental injustice with policy makers⁴⁵. Such histories from people living near the Greengairs landfill sites, members of the Ecuadorian activist group *Accion Ecologica*, and communities in Teeside are what Callewart (2002) considers essential in contextualising the problem, and for informing public policy initiatives seeking to address environmental inequalities.

⁴⁵ "'A Roch Wind Blawin": Reflections and directions on the path to environmental justice, 27 September 2003, Edinburgh' and 'Environmental & Social Justice: A consultation exercise as part of the UK Sustainable Development Strategy review, 8 July 2004, Glasgow.

To engage these different voices, and gain different perspectives, it is also useful to work with different types of evidence and ways of gathering it, for example by using social science techniques. In July 2004, the Environment Agency's Board considered that 'there was a role for social and economic, as well as natural, science' and noted that 'communications will be integral to how we use our science in policy and operations, alongside work to improve public understanding of science, uncertainty and risk' (Environment Agency, 2004g).

At the same time, the political nature of constructing new policy narratives can work to filter out the rich and complex picture of what is happening. For example, the quantitative analysis and discussions with multiple stakeholders revealed variations in the correlations between England and Wales, and different perspectives. Yet, in presenting the key issues and a small number of simple messages to the media and public, it is difficult to preserve this complexity, and can act to further exclude the voices of such critical communities.

6.6 Participation and governance

Including these diverse perspectives requires more innovative and participatory research methods and policy development processes, but also real attempts to challenge the hierarchical culture in environmental decision-making processes which attaches differential values to particular views. This inquiry aimed to involve staff from different parts of the organisation, and different sectors (e.g. NGOs and government) in developing the research and policy. Yet, there were tensions in managing different stakeholders' involvement in the process, and their varying degrees of control on the process. For example, at the start of the research process, we invited external stakeholders to identify the priority environmental issues for analysis, and shape the research process and the views on how they should be involved. However, as sponsors and managers of the research, the power to decide fell to myself and others at the Environment Agency.

It was clear from this project and from observing other science and policy processes in which the Environment Agency was engaged, that often the organisation finds it

difficult to relinquish power in managing processes. For example, consultation dominates the Environment Agency's model of stakeholder engagement, with few ambitions to progress up Arnstein's ladder of participation, where power and control is negotiated and delegated to citizens (Arnstein, 1969). Furthermore, where decisions rest with the Agency, after consultation with stakeholders, little effort is made to explain the how the outcome – or final policy position has been arrived at. Indeed, some concerns have been raised by those within the Environment Agency about the publication of this report, as a record of the internal decision-making process.

But as Baroness Barbara Young highlighted in her foreword to the Demos pamphlet on 'See-through Science' 'opening up the world of research and encouraging scientists to acknowledge the broader social and economic context within which the research will be applied should deliver more useful scientific outputs' (in Wilsdon and Willis, 2004).

Changing this norm is critical if the Environment Agency is to become a more inclusive organisation and transparent in its decision-making. This will also be essential in meeting the requirements of the Aarhus convention on 'public participation in environmental decision-making'; and in contributing to more equitable environmental outcomes.

6.7 An emergent process

This research and policy inquiry can be characterised as an emergent process, which was adapted to match the changing political context and needs of those involved. This created difficulties in maintaining clarity and transparency of the process; and consistency in those actors involved, as roles and responsibilities inevitable changed over the course of the project. But overall, it proved vital in providing a flexible framework in which I could build effective relationships with key stakeholders in the context of what turned out to be a rapidly evolving policy context.

Rather than seeing policy development as a linear process, and as simply a single decision implemented in a linear fashion, the process was more akin to what Hill has

described as a web of interrelated decisions which evolve over time during the process of implementation (Hill, 1997 in Keeley and Scoones, 1999). Taking a cyclical, rather than a linear approach has enabled me to involve stakeholders at each stage, rather than at the end of the research and policy-making process, and has provided opportunities to learn from each cycle.

However, maximising the benefit from the process was dependent on creating opportunities for reflection throughout the process, and learning along the way, for example from particular events that shaped the decision making. This was easy to do on a one-to-one basis between myself as the project co-ordinator and my direct managers and colleagues in the Social Policy Team, but more difficult amongst large groups of people, that met intermittently through tightly chaired workshops held for specific purposes, where little time was given for reflection and evaluation. If the Environment Agency is going to further strengthen its policy and advocacy, it will need to be able to learn from the development of each new policy development and advocacy initiative.

7. RECOMMENDATIONS

At each of its four stages, the project has made a series of recommendations⁴⁶. The culmination of this process was paper by the worker-researcher and the Head of Environmental Policy to the Policy Steering Group in July 2004. In accordance with its recommendations Directors agreed the need for the strategic positioning of the Environment Agency's future work in addressing environmental inequalities and the publication of the organisation's policy position – see figure 4.12 and Annexes 11. In summary, the project recommends that:

7.1 Develop the evidence base

The Environment Agency should help develop the evidence base to understand environmental inequalities and the most effective ways of addressing them, by undertaking further research to understand:

- (i) the social impacts and distribution of flooding (using the Environment Agency's new Indicative Floodplain Maps);
- (ii) the social impacts and distribution of waste management sites;
- (iii) the social impacts and distribution of water quality;
- (iv) how we can assess and address the cumulative impact of environmental inequalities on already socially and economically deprived communities;
- (v) how the Environment Agency (in collaboration with government and local authorities) can identify the worst quality environments, and develop a system on which local service providers, through local authorities and Local Strategic Partnerships can focus their efforts to improve them;
- (vi) how we can develop proportionate standards of environmental quality that take account of health and social vulnerability;
- (vii) the extent to which the Environment Agency can help address environmental inequalities through its approach to modern regulation.

⁴⁶ See Walker et al (2003); Chalmers and Madden (December 2003); Madden (2004); Chalmers and Colvin (April 2004).

7.2 Address environmental inequalities through environmental improvement and protection

The Environment Agency should do what it can to address environmental inequalities through its work to improve and protect the environment, by:

- (i) ensuring the need to address environmental inequalities is reflected in the organisation's Corporate Strategy 2006-2011;
- (ii) continuing to appraise its policies for their impacts on different social groups;
- (iii) further developing its approach to flood risk management to ensure that it takes account of the social aspects of flooding, and the needs of deprived and vulnerable groups;
- (iv) scrutinising its approach to modern regulation, to ensure that it reduces the risks of pollution to already deprived communities;
- (v) strengthening its advice to regional and local planning, to ensure that they assess how decisions and development plans will affect environmental inequality;
- (vi) continuing to work with Local Strategic Partnerships and Community Strategy Partnerships to ensure that we see year on year improvements in the quality of the environment in the most deprived areas.

7.3 Ensure others help to address environmental inequalities

The Environment Agency should help others to address environmental inequalities by:

- (i) continuing to support Defra in championing environmental equity across government;
- (ii) continuing to work with the Office of the Deputy Prime Minister, and the Welsh Assembly Government to ensure that programmes for tackling multiple deprivation recognise the environmental aspects of disadvantage;
- (iii) developing, and building on existing networks of policy makers, practitioners and researchers to address environmental inequalities.

7.4 Recommendations for developing the research and policy process

Building on the conclusions about the research and policy development process (presented in section six), I have also drawn out ways in which these above recommendations can be taken forward. So, this report also recommends that to strengthen its contribution to sustainable development through research and policy development, the Environment Agency should:

- (i) **Provide leadership** The Environment Agency has made considerable progress in improving our understanding of environmental inequalities, and has championed these issues across government, where it is possible to discern shifts in thinking about how to strengthen delivery of sustainable development. The Environment Agency should continue to shape and champion research and policy to address environmental inequalities, but also demonstrate its commitment (set out in its *Environmental Vision* and position statement) by integrating environmental equality in its own work. A quick win would be to integrate addressing environmental inequalities through the revision of its corporate strategy for 2006-2011.
- (ii) **Demonstrate the value of addressing environmental inequalities** The Environment Agency has already started to build commitment for addressing environmental inequalities within government and internally. The challenge now is to demonstrate the value of considering social deprivation within environmental policy (eg within multi-criteria analysis for flood risk management); and the value of addressing environmental disadvantage on the ground (e.g. by showing how this can more effectively deliver sustainable development). The Environment Agency should undertake practical pilots or case studies with local, regional and national partners to demonstrate the real value of addressing environmental inequalities.
- (iii) **Build on practical knowledge** Practical knowledge helps build practical solutions. The Environment Agency's policy commitments and the solutions it is advocating to others are built on the experience and practical knowledge of its staff and external stakeholders. To address environmental inequalities

at an operational level, the Environment Agency should place greater emphasis on joining up the practical experience on the ground of its staff, and the needs and views of the communities it works with, in the development of policy. A quick win would be to work more closely with internal and external stakeholders through local case studies (described above) to inform future policy for addressing environmental inequalities.

- (iv) **Value diversity** Research and policy for sustainable development is more likely to be effective if it draws on multiple methodologies, evidence and perspectives which are valued by different stakeholders. Being open to different perspectives and different interpretations has added complexity, but also depth to our understanding. The Environment Agency should support the use of social science and encourage the inclusion of more diverse voices, particularly those that are most excluded, in the development of evidence-based policy.
- (v) **Be more open and transparent** To include diverse perspectives, the Environment Agency needs to be more open and transparent in the way it develops science and policy and the decisions it makes. This also helps to build trust with those involved in the process, support for its decisions and more effective action in the long term. The Environment Agency should continue to promote and use participatory approaches to support the development of science and policy.
- (vi) **Develop emergent and adaptive management** Emergent and adaptive processes provide opportunities for learning from the development of science and policy. To strengthen its science and policy making, the Environment Agency should support greater opportunities for reflection, evaluation and learning from experience of practice and policy making – for example through work-place doctorates, learning sets, reflection, mentoring, and secondments. An early win would be to stress the importance of reflection and learning in the review of the Environment Agency's policy development cycle.

8. POSTSCRIPT

Since completing this doctoral project, time has passed and things have moved on. I chose to conclude this project and make my recommendations in April 2005 following the publication of the UK Sustainable Development Strategy, which this project primarily aimed to influence and which will provide the framework for cross-government policy and practice in England, Wales, Scotland and Northern Ireland. This postscript will briefly summarise how this project's recommendations have been implemented and the project's subsequent influence.

Each of the recommendations made by this project have been taken forward by the Environment Agency, with their implementation being co-ordinated by the worker-researcher through the continuation of my position as Social Policy Advisor.

The Environment Agency's Science Programme has provided around £150,000 to fund this post and research projects in 2004-2006. In early 2006, the Environment Agency will publish new research on the social impacts and distribution of flooding, waste management sites and river water quality (see recommendations 7.1 i-iii). A report looking at how we can assess and address cumulative environmental impacts will also be published and has helped secure £0.6 million funding between 2006-2009 from Environment Agency and government to identify the worst quality environments and develop co-ordinated action to tackle them (recommendations 7.1 iv-v). In addition, Environment Agency research is being undertaken to look at how to develop environmental standards which take account of social vulnerability; and review the extent to which the organisation can address environmental inequalities through its approach to regulation (recommendations vi-vii).

The Environment Agency is continuing to champion environmental equity through its role in environmental improvement and protection. The new Corporate Strategy for 2006-2011 *Creating a Better Place*, places greater emphasis on the organisation's contribution to people, particularly in the most deprived areas. The strategy continues the commitment to 'Actively contributing to Local Strategic Partnerships (LSPs) and Community Strategies where our objectives can be progressed', but also introduces a new target to 'Become involved in partnership programmes of action in

the most deprived areas of the country'. Progress will be measured against 'improvement in local quality of life indicators which reflect our environmental objectives, among targeted (50 per cent) LSPs, particularly in disadvantaged areas' (Environment Agency, 2006) (see recommendations 7.2 i, v and vi). The Environment Agency is continuing to appraise its policies for their impacts on different social groups using the social appraisal tool. 2005 has also seen an increased emphasis on the social aspects of flooding in flood risk management policy and support for the new review of environmental equity in modern regulation (recommendations 7.2 iii-iv).

We are continuing to work closely with Defra and together have set up a cross-government working group on addressing environmental inequalities to co-ordinate research and policy change across government and with external stakeholders (recommendation 7.3 i). The Environment Agency is developing its work with ODPM and the Welsh Assembly Government, whose Environment Strategy it has helped inform (WAG, 2006) (recommendation 7.3 ii). In addition to supporting the cross-government working group, I have continued to develop new and help build on existing networks of policy makers, practitioners and researchers, for example through representation and presentations to national and international research conferences, published papers, supporting work in Scotland and Northern Ireland. In 2006-2008, the Environment Agency is also helping to fund six ESRC/NERC trans-disciplinary research seminars on different themes around environmental equity (recommendation 7.3 iii).

Considerable progress has been made in taking forward each of the recommendations made by this project since April 2004. In implementing them, I have tried to ensure that this work places greater emphasis on the practical experience of the Environment Agency and the communities it works with; participatory approaches; and the inclusion of more diverse voices in the development of practical pilots and local case studies. However, in order to embed emergent and adaptive management and reflexive practice within the organisation will require longer-term culture change.

9. VIVA CLARIFYING STATEMENT

At the viva, the candidate was asked to append a brief statement of between 1500-2000 words clarifying the following issues:

The analytical stance and critical stance taken within the research and the extent to which it goes beyond a description of research activities.

My personal values had a strong influence on my choice of project; my underlying assumptions about the existence of inequalities in the quality of the environment; and the role of policy in tackling these differences. As a social democrat, I believe in everyone being given equal life chances – whether for jobs or clean air to breathe. To do so, I believe that policies need to set fair conditions in order to lead to more equitable outcomes; rather than in a social liberal contract of justice, which is rooted in utilitarianism and belief in inevitable inequality.

This focus on improving the environment for the most disadvantaged in society fundamentally challenges the assumptions of rationalist approaches to environmental policy, which considers that improving the overall quality of the environment will benefit everyone.

In working to change these assumptions, I sought to build the Environment Agency's understanding of environmental inequalities and the ways in which environmental policy can be used to reduce these differences within society. As Rawls (1971) proved in his experiment, enlightened self-interest leads most people to choose a fair society⁴⁷. Nevertheless, it was critical that this project's analysis of the distribution of, for example poor air quality took into account the ethical and political stance of those involved in making the changes, whilst being aware of my own.

As I reflected in my Research Methods portfolio⁴⁸, my natural instincts as a social scientist and humanist, and propensity towards a phenomenological approach leads me to place greater value on human experience, perceptions and values. I am therefore interested in how people acquire, understand and act on knowledge and the context in which people act. In addition, because of its focus on creating change, and the other demands on the project (see section 3.1), I adopted an action research approach. This approach focuses the researcher on - and leads to an evaluation of the process and its effectiveness in leading to action.

For this reason, my supervisors and I decided that the project report should tell the story and lead to an evaluation of the research process. Therefore it was important to discuss different stakeholders interpretation of the empirical and experiential knowledge gathered, and the critical activities and tipping points which led them and others to act on this knowledge. For example, in section 4.2.5 I critically review workshop participants' interpretation of data analysis and how they compare to

⁴⁷ Rawls, J. (1971) *A Theory of Justice*. The Belknap Press of Harvard University Press, Cambridge, MA.

⁴⁸ See Research Methods (DPS 4825) module portfolio – Activity 5: 'An investigation into the methodologies and epistemologies used by the practitioner researcher – with particular reference to sustainable development policy managers'.

geographical and sociological theory. In section 4.3 I draw out how this new knowledge of, for instance the distribution of industrial sites led to new scrutiny observations about the use of regulatory tools.

The balance between your direct and indirect influence and the extent to which it coincided with or caused policy change.

This project, for which I was chief instigator, manager and advocate, facilitated the development of timely new knowledge and influence on Environment Agency and government policy.

In my capacity as co-ordinator of the research and policy development process, I had a direct influence on the research process, methodology and ways in which the research was used to promote change. For example, I designed the research methodology; I undertook the majority of the qualitative analysis of stakeholders' views; and their triangulation with the quantitative analysis.

Importantly, within a hierarchical organisational environment, I was required to check the emerging findings and research process with both stakeholders and my managers. As I indicate at appropriate points throughout the report (though use of 'I' and 'we'), because of the nature of collaborating with others, there were inevitably other actors shaping the process. For example, the Head of Environmental Policy and steering group provided a steer on the focus of the project activities.

As I reviewed in section 1.2, before beginning the project, considerable evidence was already starting to emerge of the links between poverty and the environment. However, with a few exceptions, existing research had achieved insufficient engagement with politicians, government officials and regulators to build their capacity for change. This project led to the widespread adoption and use of the phrase 'environmental inequalities' and provided the necessary link between science and policy. Defra's recognition of the Environment Agency's research in the UK Sustainable Development Strategy is testament to the project's direct influence on the government's policy framework (see Defra, 2005b:95).

Policy change within the Environment Agency was as a direct result of my research. I was directly responsible for facilitating the development of new knowledge within and outside of the Environment Agency of its implications for policy and operations. While there was an existing project managed by the Social Policy Manager to develop the Agency's understanding and role in delivering social benefits, there would have been little progress in understanding environmental inequalities and the organisation's role without my lead. Other drivers, such as the Aarhus Convention and public complaints about contentious industrial sites were already raising questions about the Agency's regulatory approach. But it was my work with regulatory policy advisors helped connect environmental equity with the Agency's modern regulation approach. In the same way, while people were already challenging the dominance of economic valuation in prioritising flood risk management, the project's analysis of flood risk in relation to areas of deprivation provided timely connections between Defra's flood risk management and social justice agendas, leading to commitments in the government's strategy (see Defra 2005a).

The preconditions for change within the Agency.

The preconditions for change within the Agency are largely reflected in my recommendations for further developing the research and policy process, which are presented in section 7.4.

Leadership is critical to any change management. The Head of Environmental Policy, internal champions amongst policy advisors, regional and Area staff, and the Defra Sustainable Development also played important roles in championing these issues. But without my lead and provision of dedicated policy officer support and advocacy, the commitments to environmental equality would have had little impact on the Agency's thinking and policy. More widespread change in operational practice is now possible with the leadership from the Chief Executive, corporate commitments and government policy statements as critical points of reference.

Equally, in a process and target-led culture, it was critical that the new focus on the poorest quality environments and most disadvantaged areas is reflected in the Agency's Corporate Strategy and respective targets and performance measures in order to internalise the change within the organisation's operations. So policy positions, appraisal tools and corporate targets provide the necessary legitimacy for staff to act differently and change their focus.

Policy relevant research and involvement of the change-makers in developing the evidence base was critical to its take-up. Existing UK research on environmental justice had started to make the connections between social and environmental policy agendas (for example, Eames and Adebawale, 2002), and use the Environment Agency's own data to demonstrate inequalities (see Friends of the Earth, 2001). Without research which connected with the Agency's current policy priorities (for example flood risk management), issues of environmental equity may never have taken hold. Involving leading policy advisors in the research process also helped secure their ownership of the findings and their commitment to see them implemented.

Demonstrable outcomes are crucial to sustaining interest, enthusiasm and commitment to any change process. It was therefore critical that this project, with its focus on policy change helped track changes in people's understanding and commitment to tackling environmental inequalities. So, reflecting on progress at the beginning and end of every stage (e.g. at workshops) was key. Because of the project's focus and its relatively short timescale, it was difficult to observe change in operational practice and actual improvements in the quality of the environment in deprived areas. Nevertheless, new projects working in disadvantaged areas, for example in London and development of action plans on environmental inequalities for North Warwickshire, Coventry and Wallsall in the Midlands can, in part be indirectly attributed to my role in developing a tool to prioritise partnership work in deprived areas. For this reason, an important element of the Agency's work in 2006-2011 is therefore focused on developing fifty programmes of action to improve the worst environments in disadvantaged areas, where progress will be measured according to improvements in environmental indicators.

Reflect on the barriers to change you experienced within the research.

Firstly, the Environment Agency's risk-adverse culture inhibits its staff from engaging with more diverse and challenging perspectives and questions. The dominance of regulations, processes and targets in their day jobs often distract staff from emerging new threats to environmental quality, and the real effects it has on different people's lives. For example, while some staff were familiar with environmental inequalities in particular locations, they had often not related these issues to their own jobs and areas of influence. These barriers are equally prevalent amongst other institutions and government departments, such as the Office of the Deputy Prime Minister, and prevented this project from affecting wider change within government policy.

At the same time, there is a tendency to default to working with 'the usual suspects', such as prominent 'experts', other agencies and departments, rather than seeking opportunities to engage with communities and non-governmental organisations. I, myself found it difficult to include diverse stakeholders, particularly individuals and representatives of deprived communities experiencing poor environmental quality within the research and policy process. Now, the prominence of climate change and a commitment to diversity within the Agency's recruitment procedures and decision-making are encouraging people to embrace new challenges and diverse perspectives.

Secondly, the Environment Agency and government more widely is still struggling with being more open and transparent about decision-making process. This affected, how I, like others had difficulty in understanding what are the major factors or processes which affect, for instance, why a flood defence is built in one place and not another. Lack of openness and transparency affects how people understand and accept how different types of evidence and science are used to decide policy. And why, in writing my doctoral project, it was difficult to unpack the policy process and my perceptions of what triggered and prevented change in the Agency's position.

In some ways, this is indicative of the complexity of drivers, stakeholders, impacts and tools which affect environmental policy. In others, I think that there is a genuine fear that unveiling how things come about and opening up decision-making processes to conflicting views of the world will make it even more complex and easily challenged. New approaches, such as whole systems thinking are starting to affect the way the Environment Agency and others manage rivers and their catchments in an integrated way. At the same time, great efforts are being made, with the help of the Internet, to explain and encourage wider involvement in the regulatory process.

Lastly, there is little support for reflective practice and adaptive management. There is often limited legitimate time for staff to get away from their day job and think about and adapt to new challenges on the horizon. This was manifest in the difficulty I experienced in recruiting workshop participants, particularly amongst operational staff, and the informal thanks I received for organising such events which allowed them to think differently about their job. Meanwhile traditional training, guidance and management processes which dominate the Agency's approach, tend to suppress initiative, creativity and integrated thinking about

complex problems. But it is now encouraging to see more effort being placed on evaluation, personal development and horizon scanning.

Like, the 'preconditions for change' discussed above, each of these three related barriers which prevented me and the project affecting greater change, are reflected in my conclusions (section 6) and recommendations (section 7).

Word count: 1884

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11. ANNEXES: THE PROJECT'S OUTPUTS AND EVIDENCE OF ITS IMPACT

ANNEX 1: Contributing to joint action on poverty and environmental degradation – memo to the Chairman and Directors

Contributing to joint action on poverty and environmental degradation

While the urgency of tackling climate change was without doubt the strongest message from the Prime Minister's environmental speech in February, he also spoke of the links between poverty and environmental degradation and the need for joint action to tackle these. Recognition of these linkages can in part be credited to the Agency's ongoing research on this theme.

This briefing summarises the key points made by the Prime Minister and the Agency's response.

The Government's annual report on sustainable development 2002

In his forward to *Achieving a better quality of life*, published in February 2003, Tony Blair commented that:

"...here in the UK, people on low incomes are also more likely to suffer the worst local environmental problems, from traffic fumes and poor quality housing, to dirty streets and inadequate local amenities. But all of us pay a heavy price in our overall quality of life."

Prime Minister's Speech, 24 February 2003

Blair used his speech on 24 February to expand on this theme, noting that:

"...it is global poverty and environmental degradation that come together in the cause of sustainable development. Today I want to argue that we have not yet been nearly bold enough; and that real investment now to tackle the causes of poverty and degradation would not only yield enormous benefits to us in years to come; but they could be such a strong signal of our determination to pursue justice in an even-handed way.

Towards the end of his speech he made it much clearer how he saw poverty and environmental degradation as inter-connected:

"I believe the environment, not just globally, but locally, in our towns and cities, is overwhelmingly an issue of concern for the poorest citizens in our communities. It is the poorest that live in the worst housing, and are the most affected by traffic pollution, live closest to landfill sites and have the worst graffiti and litter problems.

The Social Exclusion Unit has analysed the concerns of people living in the 10% most deprived wards in England. Overwhelmingly they listed pollution, the appearance of their estate, and public transport as major concerns. In spite of efforts to clean up our industrial areas, poorer people are twice as likely to live near polluting factories. Children from families on low incomes are five times more likely to be killed by road transport than children from affluent areas.

We are acting now to improve quality of life by tackling poor local environments, particularly in areas of higher social deprivation. In addition to the large amounts invested in inner city regeneration, we have made available £200 million for improving streets, parks and public spaces in the Communities Plan launched by the Deputy Prime Minister earlier this month. And we have introduced the Anti Social Behaviour Bill and the Street Crime initiative with the express aim to deliver safer, less threatening streets.

By raising the standards of our local environments overall, we have the greatest impact on the poorest areas."

The Agency's evidence base for environmental inequalities

The Agency's current evidence base for environmental inequalities was presented in our September 2002 report *The urban environment in England and Wales*. It was noted here that:

"...while the links between social deprivation and environment differ depending on the environmental factor that is considered, deprivation is associated with a number of areas for which the Agency has regulatory

responsibilities, such as IPC sites, landfill sites and river water quality."

It was also noted, however, that:

"...we need to develop a much better understanding of the (potential) causality in the relationships between environmental and social deprivation...and to extend our interrogation to a broader environmental data set, covering all the key areas of the Agency's environmental responsibilities..."

A research programme to address these questions was initiated in February 2003 and a report is due in June 2003. The first interim report from the study highlights current gaps in the evidence base for environmental inequality in the UK and offers a framework for selecting a set of issues for further analysis.

The Agency's research will also contribute to the Neighbourhood Renewal Unit's study on social exclusion and the environment, due to be completed in early 2004.

For further information please contact Helen Chalmers, Social Policy Development Officer, tel. 01454 20 5555 (710-5554)

Rapid social appraisal of the Agency's corporate strategy targets

The aim of this study is to assess current knowledge and understanding within policy teams of the social issues relevant to each of the Agency's key environmental targets. This assessment will include understandings of linkages between poverty and environmental degradation, which will be fed into the environmental inequality study above.

For further information please contact Paula Orr, Social Policy Adviser, tel. 020 7863 8663 (710 8663)

Contributing to Local Strategic Partnerships

The Agency is already committed through the corporate strategy to "contributing to all Local Strategic Partnerships, focusing effort on the 50% where we can most benefit social and environmental capital, including disadvantaged communities and ethnic minorities".

Over the past year, the social policy team has been working with area managers to agree a set of risk-based criteria for prioritisation and to identify the key benefits from influencing LSPs.

As part of the wider review of Customer Services, we will be making recommendations for how this influencing and partnership relationship can best be managed, to improve the quality of life and local environments for deprived communities, as well as deliver efficiencies for the business.

We will also be liaising with ODPM and Defra to ensure that government policy in this area becomes more effectively joined up.

For further information please contact John Colvin, Social Policy Manager, tel. 01454 62 4449 (710-4449)

Sustainable Communities Plan

The Communities Plan, published by ODPM on 5 February, sets out ambitious plans for housing development in the South East and proposals for tackling housing decline and abandonment in the rest of the country through pathfinder projects.

Many of these pathfinder projects cover areas of significant social deprivation. In our liaison with ODPM (and Defra) to shape how the proposals for low demand pathfinders are rolled out, we will again be seeking to exploit the synergies between tackling poverty and environmental regeneration.

For further information please contact Simon Hughes, Urban Policy Adviser, tel. 01454 62 4449 (710-4449)

Local Initiatives

In addition to these strategic initiatives to address environmental inequalities, the Agency already supports a wide range of local initiatives. One example is the Agency's involvement in the Tyne and Wear Watersports Partnership. The project, working largely with deprived local communities, had a promotion strategy highlighting inclusion for all and provided training and opportunity for

groups that had no previous formal participation in watersports.

For further information please contact David Lawrence, Head of Recreation and Navigation, tel: 01454 624373

Forward look

In summary, the Agency is already working to improve operational delivery of environmental benefits for disadvantaged communities. And it is investing in a number of studies which will develop better understanding of the linkages between environmental and social inequalities. We aim to complete these studies by the autumn and drawing on this evidence base, make recommendations both for Government and for Agency policy and practice.

An Environmental Policy briefing from the Policy Development and Promotion team.

ANNEX 2: Environmental Equality Steering Group workshop, 3 April 2003



**ENVIRONMENT
AGENCY**

Environmental Equality Research, Policy and Action

Steering Group - Thursday 3 April 2003 - CREATE Centre, Bristol

Report on the first meeting of the steering group organised by the Environment Agency to develop priorities and a process for Agency research, policy and action for environmental equality.

1. RATIONALE FOR ENVIRONMENTAL EQUALITY RESEARCH, POLICY & ACTION

Improving environmental quality and tackling poverty are two key priorities for sustainable development. As champion for the environment, in the context of sustainable development, the Environment Agency has a key role in protecting and enhancing the environment in a way which takes account of the "the needs of people in poverty who often live in the most polluted environments"⁴⁹.

To this end, the Environment Agency's is developing an R&D programme on environmental equality. This follows the Agency's AGM (September 2000) and Mapping Common Ground (October 2001) events on environmental equality, which both highlighted the need to understand better the relationship between environmental quality and social deprivation, and the value of involving stakeholders in developing effective policy and action solutions.

2. OBJECTIVES OF THE AGENCY'S ENVIRONMENTAL EQUALITY PROGRAMME

The aim of the environmental equality programme⁵⁰ is to strengthen the Agency's contribution to sustainable development by developing a policy position on environmental equality. The objectives of this project are to:

- (i) analyse the relationship between environment inequalities and social deprivation
- (ii) critically review how the Agency could take into account any impacts of its activities on environmental inequalities and social deprivation
- (iii) develop a policy position on environmental equality

The programme adopts an action research approach and will include:

⁴⁹ Environment Agency (2001) *An Environmental Vision*, p.10.

⁵⁰ The Environmental Equality R&D programme is managed by Helen Chalmers, from the Agency's Social Policy Team, as part of a work-based doctorate in sustainable development (October 2002-September 2004)

- (i) quantitative data analysis of the relationship between environmental quality and social deprivation (being undertaken by the Universities of Staffordshire and Leeds) set within a process of multi-stakeholder dialogue
- (ii) rapid social appraisal of the Environment Agency's 46 corporate targets
- (iii) comparative analysis of approaches to environmental equality
- (iv) prioritisation of the Agency's engagement with Local Strategic Partnerships *"focusing on the 50% where we can most benefit social and environmental capital, including disadvantaged communities and ethnic minorities"*⁵¹
- (v) case studies to explore the opportunities, implications and risks of addressing environmental equality in key areas of Agency responsibility
- (vi) development of an Agency policy position on environmental equality
- (vii) external advocacy of environmental equality eg through working with NRU, DEFRA and other stakeholders

As part of this two-year R&D programme a multi-stakeholder process for research, policy and action is being developed, which commenced with a steering group meeting on 3 April 2003.

3. PURPOSE OF THE ENVIRONMENTAL EQUALITY STEERING GROUP

The steering group, which is made up of policy makers, practitioners and researchers from government, NGOs, academics and from the Environment Agency, met in order to:

- evaluate existing data and research about the relationship between environmental quality and deprivation
- identify gaps in current research, policy and practice which restrict the development of an effective approach to environmental equality, and
- develop priorities and a process for further Agency research, policy and action involving a wider set of stakeholders

4. MEMBERSHIP & FORMAT OF THE STEERING GROUP

The Steering Group brought together policy makers, practitioners and researchers from government, NGOs, academics and from the Environment Agency, who are experienced and interested in issues related to environmental equality - environmental protection, health, community development and local governance. A full list of steering group membership (and workshop groupings) is provided in Annex C.

The format of the steering group combined:

⁵¹ Environment Agency (2003) Our vision for the environment: Making it Happen - the Environment Agency's Corporate Strategy: 2002/07. p30.

- introductions from steering group members on their work relating to environmental equality
- short presentations by Environment Agency policy staff and consultants from the Universities of Staffordshire and Leeds
- two sets of small group workshops (in the morning and afternoon) to address the three aims of the steering group (see above)
- interactive open discussion and reflection on the process

5. KEY CONCLUSIONS & RECOMMENDATIONS

The following conclusions and recommendations are drawn from the research conducted by the Universities of Staffordshire and Leeds on behalf of the Environment Agency, and the outputs from the steering group meeting held on 3 April 2003.

5.1 Existing evidence of a relationship between environmental quality and social deprivation

- Scoping of existing data and research shows that there is some evidence of a relationship between environmental quality and social deprivation.
- The majority of this research is concerned with the distribution of environmental costs amongst different demographic groups.
- Existing research is primarily concerned with the air pollution, point source emissions and wastes, and major accident hazards.
- Tools are needed to examine the distributional effect of policies and processes.
- Good practice in promoting environmental equality has shown the importance of local ownership of, for example regeneration programmes; and the importance of local accessibility and participation of local communities in research, policy and action processes.
- Examining environmental inequalities in the context of sustainable development implicitly requires a holistic view and understanding of the relationships between environmental, social and economic factors; and looking beyond the issues directly addressed by the Agency's 46 targets.

5.2 Gaps in current research, policy and practice

- The limited coverage and depth of UK studies means that the empirical evidence for environmental inequality is generally weak, with substantial gaps in the research coverage of environmental issues. The need for empirical evidence to support policies and practice was recognised. However, this was tempered by steering group members highlighting the need to adopt the precautionary principle, and for Environment Agency policy and practice not to be restricted by an absence of empirical evidence.

- The majority of environmental equity studies have addressed the location of environmental hazards, implicitly assuming that higher exposure occurs with greater proximity to a hazard; rather than examining exposure or actual health impacts of potential hazards to different locations or deprived areas.
- Current research has been pre-occupied with identifying current patterns of inequality, rather than their evolution, resulting in little understanding of the causes of environmental inequalities and the socio-economic processes acting on them over time.
- Existing research has made no attempt to understand the impacts of cumulative inequalities on local areas or communities; and appropriate interventions for addressing these potential 'hotspots'.
- There have been limited attempts to evaluate observed environmental inequalities within a social justice framework, in order to understand "what is fair?" and how environmental costs and benefits should be distributed.
- There is a need to join up national analysis, policy and process, and understanding of local communities' experience of environmental inequalities; their vulnerability and resilience to risk. In the USA, reliance on a positivist approach to national environmental equity research led to loss of trust and confidence of the environmental justice community in government and the Environmental Protection Agency.

5.3 Value of Further Agency Research into Environmental Inequalities

The steering group suggested that:

- Further Agency research could make a substantial contribution to addressing the current knowledge gaps related to environmental inequality in England and Wales, and provide sound evidence for policy and practice.
- Better understanding of the relationship between environmental quality and social deprivation will support the Agency's contribution to sustainable development, whilst mutually advancing environmental improvement and the quality of life of socially deprived communities.
- Further research and development of policy responses will assist the Environment Agency in developing a proactive response to growing legislative and political (national and local) pressures on the Agency to address issues relating to poor environmental quality, urban renewal, poverty and inequality.
- Developing research and policy on environmental equality will also enable the Agency to champion these issues and influence the agendas of government and EU policy, and that of other agencies and partners.

- This programme provides an opportunity for the Agency to build relationships and dialogue with new audiences, organisations and excluded communities.

5.4 Criteria & Priorities for Future Agency Research

In its second phase of analysis, the steering group recommended that the Agency should prioritise:

- Analysis of the relationship between social deprivation (as indicated by the Index of Multiple Deprivation 2000) and issues for which the Environment Agency has regulatory responsibility. However, the steering group also strongly recommended that further Agency research should not be confined to a small number of regulatory activities, but recognise wider environmental and social issues.
- Detailed analysis of three ('benchmark' or politically important) environmental issues; ie air quality, flood hazard, IPC sites on which the Agency was able to deliver change.
- Analysis of the (physical and psychological) health impacts of exposure, rather than simply proximity to environmental hazards.
- Research into environmental inequalities should also consider local communities' access to 'environmental goods', for example access to green space or 'blue space' (ie waterways) – in addition to the impacts of 'environmental bads' (eg air pollution).
- Further research into locally relevant issues for deprived communities, eg air quality, environmental crime, fly tipping or access to 'blue space' (waterways).
- Detailed analysis of the causes of environmental inequalities; for example, using longitudinal studies to examine the temporal changes in inequalities over time relating to a particular environmental variable (eg air quality).
- Examination of the cumulative impacts of multiple environmental inequalities on a community or neighbourhood, for example, through the development of a local case study (but being careful to avoid local blight).

A revised profile and methodology for the data analysis to be undertaken in April – June 2003 is presented in Annex A.

5.5 Process of stakeholder dialogue

- The steering group was broadly supportive of the proposed process and commented that it felt "constructive and worthwhile".

The steering group recommended that:

- the process be structured to enable the Agency to develop an internal process (eg by holding an internal workshop in June 2003) to consider the results of the analysis in Phase 2 and the implications for Agency policy and practice
- the steering group reconvenes in September/October 2003 to consider the results of the analysis undertaken during the summer
- the Agency considers ways of involving a wider network of stakeholders in the research
- the Agency utilises existing networks to engage others and disseminate the research (eg Environmental Justice Network, Sustainable Development Research Network)
- steering group members assist the Agency in its research by providing ideas for linkages with other initiatives, research and programmes
- the Environment Agency's Environmental Equality programme should support the Neighbourhood Renewal Unit's 'Achieving Environmental Equity in Neighbourhood Renewal Policy and Action Plan'

In response to these recommendations made by the steering group on 3 April 2003, the design process for Environment Agency research, policy and practice on environmental equality has been revised and is presented in Annex B.

Helen Chalmers
Environment Agency
April 2003

ANNEXES

Annex A	Outline of environmental quality and social deprivation data analysis profile and methodology
Annex B	Time scale for revised R&D programme [February 2003 – March 2004]
Annex C	Steering group membership and small workshop groups
Annex D	Outputs of Environmental Equality steering group – 3 April 2003
Annex E	Environmental quality and social deprivation data analysis: Executive summary
Annex F	Evidence base for environmental inequalities – Presentation by Dr Gordon Walker [not included in this report]
Annex G	Criteria & Priorities for further research – Presentation by Dr Gordon Walker [not included in this report]

ANNEX A Outline of Environmental Quality & Social Deprivation Data Analysis Profile and Methodology: April – June 2003

The outcome of discussions at the workshop on 3rd April was to recommend that the Agency focuses its data analysis on a limited number environmental equity issues and to carry out this analysis in some depth, rather than to analyse a broader range of issues more superficially. Three specific issues were identified as particularly relevant to the remit of the Environment Agency and most appropriate for analysis within this project – air quality, flood hazard and IPC sites.

For each of these issues we have developed a proposed profile of variables to analyse and in some cases to interrelate. In all cases we will use the ward level Index of Multiple Deprivation (IMD) data for 2000 as the social variable and undertake an analysis for both England and Wales. As the IMD for England is constructed on a different basis from that for Wales, all of the analyses will need to be undertaken separately for the two areas. We will wherever possible be reporting the results using deciles of deprivation. These will be based on population rather than number of wards, so that each decile contains approximately equal numbers of people rather than equal numbers of wards.

Air Quality

Five variables will be analysed using 2001 annual mean data available on a 1km² grid from NETCEN: NO₂, PM₁₀, SO₂, CO and benzene. Two of these variables NO₂ and PM₁₀ will also be analysed for predicted levels in 2015, so that we can assess how the expected changes in concentration differentially affect more or less deprived groups. As well as analysing annual mean concentrations we will also conduct separate analyses of exceedences of standards.

In addition to single pollutant analyses we will seek to identify the cumulative inequity pattern through application of an air quality index. Several indices are described in the literature and we will select and apply one of these.

Flood Hazard

Indicative floodplain maps produced by the Agency will be used to relate to ward deprivation data. These maps show 1 in 100 year peak water level return periods for rivers and 1 in 200 year floods for coasts or the highest known water level. We will use a sophisticated method to ensure that only the population within wards that are also within the floodplain area is counted within this analysis. Many wards will have rivers running through their area but no people actually living within the floodplain, particularly in rural wards. By using Codepoint data which provides a count of residential properties within each postcode unit, we will be able to estimate the numbers of people in each ward that live within and outside of a floodplain. Results will then be reported, for example, to show the percentage of population for each deprivation decile that lives within and outside of flood hazard areas.

There is a further dataset of 'flooded properties' collected by the Agency which we have yet to access and investigate as to whether it could add additional useful dimensions to the equity analysis. We have also as yet to establish if data are available on locations of flood protection investments to examine how these relate to deprivation levels.

IPC Sites

The profile of analyses for IPC sites is currently less resolved, in part due to the many different ways in which these can be subdivided and the many pieces of information about each site that can be built into the analysis. There are also some data quality and availability questions which are still being addressed.

In order to relate the location of the IPC site and associated emissions to a nearby population and deprivation value we will use a circular buffer around each site rather than simply relying on its location within a ward. We will then, as for the flood hazard analysis, use Codepoint to allocate the population in each affected ward as either within or outside the buffer area. This method addresses the problem of wards being different shapes and sizes and is an improvement on the IPC site equity analyses undertaken to-date. It does not however provide any form of hazard or risk based differentiation between sites in the process of determining the extent of deprivation in nearby populations.

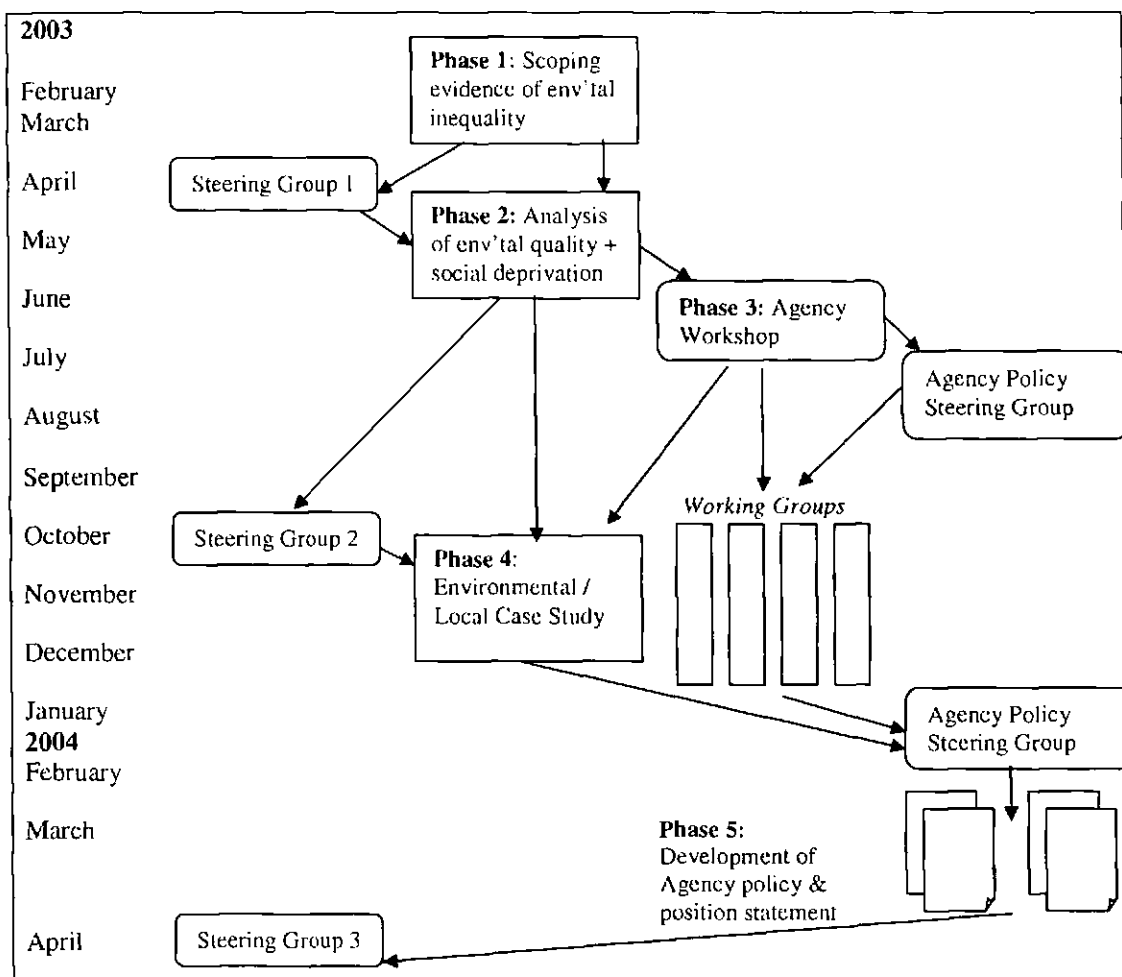
Having established an associated population deprivation value for each IPC site we are currently investigating the viability of undertaking the following analyses:

- *all IPC sites*; a basic analysis for comparison with results of existing analyses;
- *IPC sites subdivided by IPC process category* (fuel production, metals production and processing, minerals industry, chemical industry, waste disposal and recycling and other industries); to explore if there are different patterns across the process categories;
- *subset of IPC sites producing emissions to air*; a focus on those sites likely to present a more significant risk to public health rather than to the environment;
- *all IPC sites by OPRA pollution hazard (PHA) rating*; this is a multidimensional score derived by Environment Agency inspectors indicating the level of pollution hazard from each site and thus enables us to differentiate between higher and lower hazard sites;
- *all IPC sites by OPRA operator performance (OPA) rating*; this is a multidimensional score derived by Agency inspectors which indicates how well the site is run and thus enables us to investigate if there is any association between company performance and deprivation;

- *all IPC sites by OPRA score for 'offensive characteristics'; this is one component of the PHA score and enables us to identify sites that have emissions that are likely to cause local nuisance (such as smell);*
- *all IPC sites by frequency of inspection by the Environment Agency; this dataset is yet to be examined but may provide insights into patterns of Agency regulatory activity;*
- *subset of IPC sites receiving initial authorisations within last 4 years; this may provide insight into whether contemporary processes of siting are producing similar patterns to historically established patterns of site locations;*
- *pollution incidents related to IPC sites; this utilises a separate dataset held by the Agency on pollution incidents;*
- (n.b. the term sites has been used above for simplicity; in some cases analyses will be of the separate authorisations at and emissions from each site);

This list of analyses is not definitive or prioritised and others could be proposed, for example making greater use of inventory release data. A final resolution of priorities will depend on resolving data complexities as well as feedback from other parties.

ANNEX B Time scale for revised R&D programme [February 2003 – March 2004]



Phase 1: Scoping Report [February – March 2003] produced by consultants at the Universities of Staffordshire and Leeds, which includes an evaluation of existing research and analysis of the relationship between environmental quality and social deprivation; identification of gaps in existing research; and recommendations for criteria and priorities for further research.

Phase 2: Steering Group & Analysis [3 April 2003, April – June 2003] Following the recommendations by the Steering Group, the consultants from Staffordshire and Leeds Universities will undertake further analysis of data sets relating to environmental quality and social deprivation. The analysis in Phase 2 will focus on three specific issues which were identified as particularly relevant to the remit of the Agency and most appropriate for analysis within this project – air quality, flood hazard and IPC sites.

Phase 3: Internal Agency workshop and working groups [late June – December 2003] An internal workshop will be held in June to make sense of the phase 2 findings and develop recommendations for Agency policy responses and

further research. This workshop will include the development of internal working groups around key areas of Agency responsibility and their relation to environmental equality. For example focusing on the three areas analysed in Phase 2 - air quality, flood hazard, IPC sites.

Phase 4: Environmental / local case study [October 2003-December 2003]

Following the second meeting of the steering group, a case study will be conducted to examine either; the causes of inequality for an environmental issue for which the Agency has responsibility (eg air quality), or the cumulative impacts of multiple inequalities on a local area or community.

Phase 5: Policy Development [January – March 2004] The internal Agency workshop and working groups will help inform the development of a draft Agency policy and external position statement on environmental equality. The draft policy and position statement will be developed by the steering group and presented to the Environment Agency's Policy Steering Group in January 2003.

Time (2003)	Who	Activity
5 March 03	Consultants Project Board, Helen Chalmers	Brief scope and summary of existing research and analysis examining the relationship between environmental quality and social deprivation, with accompanying gap analysis.
19 March 03	Consultants Project Board, Helen Chalmers	Evaluation of existing analysis and methodology used by the Agency for exploring the extent to which environmental conditions vary across socially deprived wards (as identified by the Index of Multiple Deprivation).
19 March 03	Consultants Project Board, Helen Chalmers	Identification of data sets which could be used to develop understanding of the relationship between the aspects of environmental quality for which the Agency has regulatory responsibility and social deprivation.
24 March 03	Consultants Project Board, Helen Chalmers	Interim report on review of evidence, quantitative analysis of existing data sets, and evaluation of key findings
3 April 03	Steering group Consultants Project Board, Helen Chalmers	Steering Group workshop to evaluate existing data and research, identify gaps in current research, policy and practice, and develop priorities and a process for further Agency research, policy and action involving wider stakeholders
6 June 03	Consultants	Final report from consultants including recommendations for Agency policy responses and further research.
Wk beginning 9 June 03	Project Board Helen Chalmers	Project Board meeting to review final report and recommendations and design internal workshop
Wk beginning 30 June 03	Agency staff Project Board, Helen Chalmers	Internal Agency workshop to make sense of the findings and recommendations for Agency policy responses and further research.
17 July 03	Project Board, Helen Chalmers	Paper to Policy Steering Group to present results of analysis and recommendations for Agency policy responses and further research
17 July 03	Joining Up Project Development Group	Paper to Joining Up Project Development Group to present results of analysis and recommendations for

	Helen Chalmers	Agency policy responses and further research
Mid October 03	Steering group Project Board, Helen Chalmers	Steering group workshop to review analysis and recommendations for Agency policy responses and further research
October – December 03	Working groups, Project Board Helen Chalmers	Working groups on areas of Agency responsibility eg air quality, flood hazard, IPC sites to develop policies and recommendations to promote environmental equality
October – December 03	Consultants / working groups Helen Chalmers	Case study on either an area of Agency responsibility (eg air quality) or local neighbourhood to examine impacts of cumulative environmental inequalities
January 2004	Project Board , Helen Chalmers	Paper to Policy Steering Group to present draft Agency policy and position statement on environmental equality
March 2004	Steering group Project Board, Helen Chalmers	Steering group workshop to present draft Agency policy and position statement and progress in promoting environmental equality
To publish in April 04	Project Board, Helen Chalmers	Agency publication on Environmental Equality

ANNEX C Steering group membership and small workshop groups

Environmental Equality Steering Group – 3 April 2003

Name	Title	Organisation
Simon Bingham	Principal Assessor, Planning & Reporting	Environment Agency
Eric Blencowe	Head, General Sponsorship, Environment Agency Sponsorship Division	Department for Environment, Food and Rural Affairs (DEFRA)
Jayne Boys	Access to Environmental Justice Team Leader, Sustainable Development Unit	Department for Environment, Food and Rural Affairs (DEFRA)
Mike Brewer	National Capital Investment Manager, Flood Defence	Environment Agency
Simon Bullock	Environmental Justice Programme Manager	Friends of the Earth
Helen Chalmers	Social Policy Development Officer	Environment Agency
Chris Church	Sustainable Development Advisor	Community Development Foundation
John Colvin	Social Policy Manager	Environment Agency
Mike Egghoro	Technical Manager (Hydrology)	Environment Agency
Jake Elster	Research Officer, Centre for Analysis of Social Exclusion	London School of Economics
James Friel	Development Worker - Birmingham	Black Environment Network
Michael Frost	Policy Advisor	Neighbourhood Renewal Unit, ODPM
Sara Fuller	Research Fellow	University of Westminster
Jimi Irwin	Head of Centre for Risk & Forecasting	Environment Agency
Gareth Jones	Head of Health & Environment	Department of Health
Peter Madden	Head of Environmental Policy	Environment Agency
Dr Gordon Mitchell	Senior Researcher	University of Leeds
Sue Porter	Facilitator	Sustainable Futures
Martin Stark	Fisheries Policy & Process Manager	Environment Agency
Derek Tinsley	Human Health Policy Manager	Environment Agency
Dr Gordon Walker	Director of Institute for Environment & Sustainability Research	Staffordshire University
Janine Wigmore	Projects Co-ordinator	Groundwork

Group 1

Jayne Boys
Simon Bullock
Mike Egghoro
Sara Fuller
Derek Tinsley
Dr Gordon Walker
(Facilitator)

Group 2

Chris Church
Dr John Colvin (Facilitator)
Jake Elster
Michael Frost
Jimi Irwin
Dr Gordon Mitchell

Group 3

Helen Chalmers (Facilitator)
Simon Bingham
Eric Blencowe
James Friel
Peter Madden
Martin Stark
Janine Wigmore

ANNEX D Steering Group Outputs

The steering group workshop produced the following outputs:

Introductory Presentations

Introductory presentations were given by Environmental Policy staff from the Environment Agency who are leading this programme on environmental equality.

Drivers for Environmental Equality - Peter Madden, Head of Environmental Policy

The Agency's Head of Environmental Policy opened the workshop by thanking attendees for agreeing to be part of the project and attending the workshop. Peter Madden then identified some of the drivers for environmental equality, including:

- the UK Sustainable Development Strategy
- the rise in poverty and inequalities
- environmental inequalities
- Government policy and programmes for tackling poverty and urban renewal

He then highlighted some of the Environment Agency's responsibilities and its commitment to sustainable development and "a healthy, rich and diverse environment in England and Wales, for present and future generations" which is outlined in the Agency's Environmental Vision.

Progress to date - Dr John Colvin, Social Policy Manager

Dr John Colvin introduced the Environment Agency's work on environmental equality by outlining some of the background and recommendations made by previous Agency initiatives. He highlighted the Agency's AGM on 'Achieving Environmental Equality' in September 2000 and the Mapping Common Ground event organised jointly by the Environment Agency and Capacity Global in September 2001.

He reported on the previous analysis conducted by the Environment Agency on environmental quality measures, such as proximity to IPC sites and river quality, and their relationship to areas of multi-deprivation, which is presented in 'Our Urban Future' (Environment Agency, 2002).

Lastly, John Colvin outlined some of the Agency's current work which supports this programme on environmental equality, including: targeting work with Local Strategic Partnerships in disadvantaged areas, the development of a social appraisal tool and promoting environmental improvement as part of regeneration programmes.

A Process for developing Research, Policy & Action on Environmental Equality – Helen Chalmers, Social Policy Development Officer

Helen Chalmers described the proposed programme for developing the Agency's research, policy and action on environmental equality. She started by outlining the aims of the process which steering group members are being invited to shape. Helen Chalmers reported that the steering group has been formed to help shape the analysis to be undertaken in Phase 2 and the development of Agency policy responses and recommendations.

Evidence base for Environmental Inequalities - Dr Gordon Walker, Director of Institute for Environment & Sustainability Research, Staffordshire University

In his first presentation, Dr Gordon Walker provided an overview of the literature review carried out in Phase 1 to scope the evidence base for environmental inequalities and gaps in current research. Dr Walker reported that the literature review focused on UK research and empirical data analysis which looked at deprivation and exposure to environmental impact for 8 environmental issues; air quality, drinking water quality, point source emissions and wastes, major accident hazards, contaminated land, flood hazard, surface water quality and noise. The review concluded that there is a limited body of sophisticated evidence of environmental inequalities, with no research on causal mechanisms or the impacts of cumulative inequalities.

Criteria & Priorities for Further Research - Dr Gordon Walker, Director of Institute for Environment & Sustainability Research, Staffordshire University

To open the afternoon workshop to identify the value of and priorities for this research, Dr Gordon Walker suggested why there was value in carrying out further analysis of environmental and social deprivation data sets. He outlined the three criteria used to identify priority issues and data sets to be analysed by further research; the significance of the issue, its relevance to the Agency's remit, and the availability of sufficient data for robust analysis. Using these criteria, the research team at the Universities of Staffordshire and Leeds had ranked a number of environmental issues as being of high, medium or low priority. The table below shows these rankings.

Lastly, Dr Gordon Walker highlighted some of the methodological complexities involved in such research and proposed an approach to further Agency research. He proposed that this second phase of research would include; identifying patterns of inequality, conducting some longitudinal analysis to identify changes (and potentially the causes of) patterns in inequality over time, and use of integrated analysis to help identify inequality 'hotspots'.

These presentations summarised the key findings of the research conducted in phase 1, which are presented in an executive summary in Annex E (see separate

attachment). The slides used by Dr Gordon Walker in his presentations are provided in Annex F and G (see separate attachments).

Priorities for environmental equity analyses

(a) High priority for further analysis

Environmental topic	Comment on categorisation
Air quality standards (NAQS standards exceedences - variables selected on basis of frequency of exceedence)	Very significant with respect to legal obligations (e.g. EU standards, Aarhus) and to health; Extend analysis to further variables considering both annual mean and peak standards.
Air quality (Concentration of NAQS pollutants - to be selected)	Health concerns remain below standard level; Extend analysis to further variables (to be confirmed from CO, PM ₁₀ , PM _{2.5} , SO ₂) with known health implications. (see COMEAP).
Potable water quality standards % compliance failure (all and/or parameter specific)	Most significant water variable given direct health impact, but more relevant to remit of DWI than EA. Data holdings require investigation.
Flood Hazard	Significant with respect to vulnerability and health, and also the EA remit; May be appropriate to address equity for different flood return periods.
Proximity to polluting sites (Including IPC sites and waste incinerators)	Some existing UK analysis, but should be extended to consider greater range of site characteristics (e.g. size, type, buffer area) to improve assessment of risk
Proximity to major accident hazard sites	Some existing UK analysis, but should be extended to cover deprivation, consider greater range of site characteristics (e.g. size, type, buffer area) to improve assessment of risk. Remit of HSE not EA
Pollution incidents	Relevant re health and vulnerability; Good data availability with no known UK analysis to date.
EA permits : prosecutions, cautions and compliance	Significant in terms of EA enforcing compliance equitably. Requires careful analysis (e.g. comparison of like permits and facilities). May be affected by company factors external to EA.
Facility inspection rates	Significant in terms of EA policing polluters equitably. Requires careful analysis (e.g. comparison of like permits and facilities). Should be independent of external EA factors.

Table (Cont.)

(b) Medium priority for further analysis

Environmental topic	Comment on categorisation
Noise	Data availability problem (may be resolved via EU directive requirements) and possible reporting bias.
River water quality (aesthetic)	Valid reasons for analysis but of low significance; analytical problems re determining social distribution of benefits.
Coastal water quality	Valid reasons for analysis but of low significance; analytical problems re determining social distribution of benefits.
Access to green space	Valid reasons for analysis but of low significance; analytical problems re determining social distribution of benefits.
Contaminated land	Good reasons for analysis but major problems with data availability.
Proximity to landfill	Analysis would require significant development (based on landfill type, size, age etc) so as to extend existing UK analysis.
Locally unwanted land uses not covered elsewhere (roads, STW's, pylons etc.)	Specific land uses of concern need to be identified and evaluated on basis of significance, interest to EA, data availability and technical feasibility of analysis.

(c) Low priority for further analysis

Environmental topic	Comment on categorisation
Odour	Problems with data availability and possible reporting bias.
River water quality (chemical & biological)	Weak reasons for analysis; analytical problems re determining social distribution of benefits.
Contaminated land clean ups	Demand for clean up driven by developers.
Local environmental quality	No good indicator with national data coverage
Biodiversity (plants, birds)	Relevant only with respect to amenity, for which it is a poor surrogate measure.
Planning applications approved against EA advice	No good rationale for analysis; technical difficulties.
Access to recycling facilities (locally, kerbside etc.)	A weak indicator of environmental institutions acting equitably
Sustainable development awareness and training programmes	A weak indicator of environmental institutions acting equitably (difficult to measure, even expenditure per head does not reflect institutional equity well, as environmental needs (e.g. flood protection, pollution control) vary greatly according to local context.
Community participation in EA participatory initiatives.	Response is a poor (indirect) measure of EA effort to involve communities in environmental issues.

WORKSHOP 1: Evidence base for environmental inequalities

Aim: to map the current evidence for environmental inequality.

Steering group members were divided into three groups to examine the following questions, and report their findings to the wider group.

Q1: What do we know about the relationship (the nature of the linkages) between environmental quality and social deprivation?

Group 1

- Data gaps appear because of cumulative impacts of no action (no protests against planning permission; little policing by regulator = little data)
- Perceptions can cause stress and economic deprivation (eg incinerators)

Group 2

- 'The value of working bottom-up (joined up pictures) as well as top down
- Key NRU question: how will we change things?
- use "active" issues – build it on experiences of people in deprived communities - and how are they approaching these issues?
- don't we need to do more "bigger picture" work to inform the priorities of the study?
- Housing is such a key issue - see Peter Ambrose work - very little research of this type – there might be lots of other examples - Stepney health gain (before/after regeneration) – difficult to identify research funding to do baselines
- Oxford transport study (before/after) – potentially significant health effects – community epidemiology

Group 3

- Links between environmental crime and anti-social behaviour
- Importance of ownership of process, accessibility, participation
- Historical siting of (traditional) industry is due to social and economic processes – what about distribution of landfills, IPC, sewage treatment plants – and relationship to social/housing processes?
- are industries in deprived areas being run less well?
- is the Agency seen to be regulating differently in different areas?
- There will always be trade-offs – eg siting of airport could have impacts on health or biodiversity
- Use of other drivers – eg regeneration

Q2: What else do we need to know? (Identification of gaps in current research, policy and practice)

Group 1

- Need a model to understand relationships and what we need to know (eg air pollution + drugs + drinking – including multi-factors)

- Look at policies and tools to examine their effect on social distribution – map the consequences (eg flooding / cost-benefit analysis and the old)
- Are we using an integrated policy appraisal tool to look at social differentiation impacts (eg incinerator locations)

Group 2

- What is the relationship between national datasets and locally relevant work?
- Don't narrow down research to Agency remit
 - think more laterally
 - see linkages poor insulation in housing = heating costs + climate change impacts, car ownership = accidents
 - who benefits?
 - where are the impacts / risks?
- Incorporating social impact issues into flood defence thinking – equality dimensions of resilience
 - managing blame
 - community development for disaster prevention
 - social capital?
 - psychological
 - build defences vs sandbags
 - age of housing significant? – new build at risk?
 - at risk communities, what do we know? – flood plains/low lying vs riverside communities
- Statistics research
 - often greater quality within universities
 - GIS
 - local authority databases
- Gaining some consistency across measures with Agency lens on input to NRU data mapping – Peter Hedge

Group 3

- Causal links
- Cumulative impacts [of environmental bads]
- Where do you best invest – eg in hotspots, areas experiencing cumulative impacts?
- Comparative health impacts of alternatives – eg difference between health impacts of recycling, landfill? – need for holistic picture of relationships [between environmental quality and deprivation] and scale of impacts
- Concern that we are not dependent on evidence before we act – precautionary principle vs. evidence based approach
- Is the research going to look beyond the Agency's 46 targets?

WORKSHOP 2: Criteria and priorities for Agency research, policy and action

Aim: to identify the value of and priorities for this research

Q1. What do we think is the value of doing further research within the Agency?

Group 1

- Test and justify policies
- Assess how the Agency is doing on social environmental impact
- Arming Agency to argue for environmental issues
- Criteria: where relevant evidence would change things and make sure output is used

Group 2

- How do we evaluate non-environmental benefits of environmental work and vice versa (looking at knowledge gaps between projects – environmental NGOs, voluntary sector, community groups)
- Need for user-friendly information, good presentation – eg use of NRU knowledge management system
- Yes, we see real value in addressing these knowledge gaps – providing sound evidence for internal policy, process and action
- A clearer, sounder picture of the relationship between environmental quality and social deprivation
- Building broader support for work for Environment Agency (beyond fire-fighting)
 - what is happening?
 - why is it happening?
 - anticipating what might happen in future

Group 3

- Need for more research
- Add value by integrating sustainable development into regulation
- Influencing government policy, EU policy and those of other agencies
- Provide exemplar for other government departments – Agency to champion issue
- Change how the Agency and other agencies behave
- Build relationships and dialogue with new audiences to enable Agency to receive feedback
- Lead to working with different organisations and people
- Open Agency up to new thinking
- Identify research needs for the Agency
- Define what the Agency won't do and help the Agency focus on priorities

Q2. What should be the priorities for this research?

Group 1

- Fewer 'benchmark' studies rather than spread too thin
- Are we aware of what is going on currently?
- Examine one impact (eg air quality) – looks at Agency policies and practices that influence impact – risk based inspections (level 1-4) vs. social environmental impact
- Choose neighbourhoods with a number of cumulative impacts (eg odour, waste, PPC etc) – do without mentioning neighbourhood (ie to prevent local blight of community image)
- Access to environmental goods

Group 2

- Credibility issue important
- Political profile (locally relevant and accessible) – especially for local people in deprived communities (“more immediate interest”) few currently in priority list – “tactical” – links to NRU research;
 - litter/dog mess
 - environmental crime/fly-tipping
 - local environmental quality? or
 - access to environmental goods
- Subjective measures – but local authorities don't have questions to ask – eg percentage of people who felt satisfied with their local environment
 - COMPASS software for comments groups
- NRU evaluation of LSPs + neighbourhood “issues”

Group 3

- Priorities focus on health impacts of exposure – should we widen high priorities to include wider psychological impacts of environment? For example, access to biodiversity plays a major role in social and environmental equity
- Weak links made between river quality and health in prioritisation
- Priorities focus on exposure to environmental impacts, rather than access
- Priorities driven by data availability
- Importance of public participation as element of decision-making process for all environmental issues (but currently given a low priority)
- Potable water quality should be a low priority (rather than high priority)
- Key priorities should be:
 - air quality
 - proximity to pollution
 - quality of Agency regulation – eg enforcement
- Flood hazard should stay high priority because:
 - important issue for vulnerable communities
 - priority for the Agency
 - increase in funding
- Little about 'environmental goods' eg access to green space (Urban Green Spaces Task Force should have relevant data) – but not remit of Agency
- Exclusion of non-Agency remit issues could be overcome by:
 - acknowledge lack of remit/resources
 - identify relevant partners we need to influence/work with

- include recreational access to water
- emphasise connections between Agency-remit issues and eg transport, air quality
- Focus on Agency remit-issues enables
 - political saleability
 - Agency staff have capacity to act
 - Agency needs to show it can deliver on what is identified through research
- Are the priorities representative of concerns of deprived communities? ie traffic, graffiti, green space

Whole group discussion

- Value in looking at environmental crime – eg fly tipping, particularly where the Agency can pick up on the cumulative impacts of environmental inequalities
- Little correlation with research on health, eg Acheson report provides one of best analyses
- There will always be a lack of data – we should be applying the precautionary principle and not wait for data
- Concentrate research where the evidence can change things – the 'big' issues
- Include as higher priority those areas of concern for local communities
- Knowledge gaps for others eg NGOs and local communities
- Agency has a multi-level role: acting itself, partnership with others, influencing others to act and advocacy to government, Europe etc

Q3. What do you think of the proposal for the next phase of Agency research (April – June)?

Group 3

- Research should be 'fit for purpose'
 - at this point ward level is most developed for index of multi-deprivation
 - but NRU – neighbourhood statistics coming on stream in September 2003
 - audit (levels of) datasets currently available would be useful
- Longitudinal analysis would be useful – dynamics of deprivation not too significant in a national overview
- Integrated analysis: how do we select sites?
 - avoid blight of local communities
 - work with LSE or London School of Hygiene case studies

WORKSHOP 3: Research, policy and action process

Aim: to design and agree the process for the research beyond phase 2.

Q1. Should we have further meetings of this group? If so is the constituency of this group right?

- The constituency of the group is currently fine and was felt to have enough commonality to be an effective group
- It feels constructive and worthwhile
- Extend the process, slow things down
- Develop internal Agency dialogue first, before reconvening steering group
- Meet again in September to hear back about the research results – we can only decide about the next stage at that point
- Involve communities in wider consultation (after September), get closer to the ground
- Email current steering group for ideas of research etc ongoing that this project and Agency generally should link into
- Link into NRU research on environmental equity

Q2. Who should be involved in the wider consultation, and how? Eg dissemination of results

- Lack of business voice
- Useful examples of the responses of business to the environmental justice agenda in the US and examples of Good Neighbourhood Agreements for brokering agreements between business and local communities
- The Environmental Justice Network and Sustainable Development Research Network could provide useful routes for dissemination

Q3. What further analyses, policy and action by the Agency needs to be taken beyond the next phase, ending in June?

- There may be value in piloting some work to explore how the Agency can support deprived communities (eg linking up with the LSE case studies)
- Development of internal Agency process and advocacy

Q4. What are others doing that the Agency should be supporting?

- NRU programme on environmental equity

Next Steps

Helen Chalmers to circulate report of steering group, including: the executive summary of interim reports 1 & 2, produced by the consultants, a revised process for the Agency's environmental equality research, policy and action.

**ANNEX E Environmental Quality & Social Deprivation Data Analysis:
Executive Summary: Interim Reports 1 & 2**

Not included for the purposes of this report

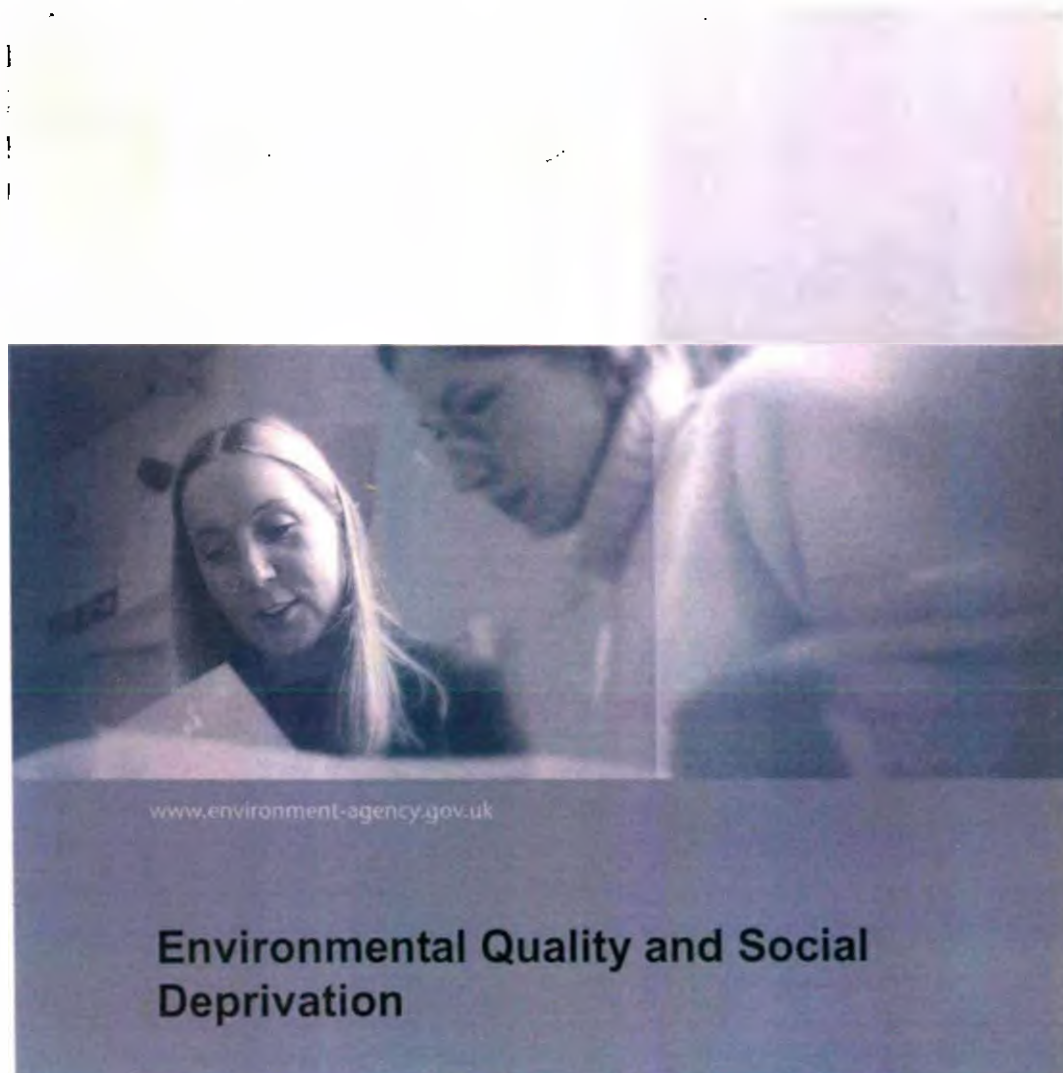
**ANNEX F Presentation by Dr Gordon Walker: Environmental quality and
social deprivation analysis**

Not included for the purposes of this report

**ANNEX G Criteria & Priorities for further research – Presentation by Dr
Gordon Walker**

Not included for the purposes of this report

ANNEX 3: Environmental quality & Social Deprivation Analysis and Recommendations



R&D Technical Report E2-067/1/TR



**ENVIRONMENT
AGENCY**

Environmental Quality and Social Deprivation

R&D Technical Report E2-067/1/TR

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Statement of Use

This technical report summarises the results of research which analyses the relationship between environmental quality and social deprivation. The information contained in this document is intended to support policy development to help promote environmental equality.

Keywords: Environmental quality, social exclusion, deprivation, equality, equity, environmental justice, flooding, Integrated Pollution Control, air quality.

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EXECUTIVE SUMMARY

Aim of the Project

The aim of this project was to improve the Environment Agency's understanding of the relationship between environmental quality and social deprivation. Whilst there has been a general recognition that deprived communities are likely to experience disproportionate levels of pollution and other forms of environmental degradation, the evidence-base for policy development by the Agency and others has been lacking.

Context

Environmental protection and social justice, two of the fundamental tenets of sustainable development, are brought together by 'environmental equity' or 'environmental justice'. Environmental justice is concerned with how environmental bads (such as pollution) and goods (such as access to greenspace) are distributed across society, as well as with the equity of environmental management intervention and public involvement in decision-making. The environmental justice approach was pioneered in the USA by civil rights activists and is now receiving increased attention in Europe, in part due to the rights embodied in the 1998 Aarhus Convention.

The Existing Evidence Base

Whilst there are many dimensions to environmental equity, an important starting point is to establish the extent to which environmental quality is unevenly distributed across social groups. A wide ranging literature review, focusing on eight environmental issues, found a generally weak and limited research base in the UK. Only work on air quality and industrial emissions and wastes provided more than one or two studies. Combined with a systematic gap analysis, which identified 33 environmental variables and 12 theme areas potentially relevant to equity analysis, we therefore conclude that the gaps in the current UK evidence base are substantial.

The Equity Analyses

The prioritisation of environmental issues for analysis in this project was informed by the gap analysis and a workshop involving internal and external stakeholders. The outcome was to highlight three issues of particular relevance to the Agency: flooding, Integrated Pollution Control (IPC) sites and air quality.

For each of these issues an equity analysis was undertaken separately for England and Wales using the ward level Index of Multiple Deprivation (IMD) as social variable. The approach used for each part of the analysis was carefully developed in recognition of the many methodological complexities involved. There are inevitable limitations arising from the quality and resolution of source data sets, the spatial scale of analysis and the complexity of real-world environmental variables.

Flood Hazard and Deprivation

The indicative tidal and fluvial floodplain maps produced by the Agency were used to relate to ward deprivation data.

- For England, the tidal floodplain analysis shows a clear relationship with deprivation. Of the population living within the tidal floodplain there are eight times more people in the most deprived decile compared to the least deprived (deciles provide ten ranked groupings of wards, from the 10 % most deprived to the 10 % least deprived).
- In contrast, for the fluvial floodplain there is an inverse relationship with deprivation, although of lesser strength, with a higher proportion of the floodplain population in the more affluent compared to the more deprived deciles.
- For Wales, the pattern of social distribution is less distinct but shows some similarities to England. For fluvial floodplains the proportions in the least deprived and most deprived deciles are broadly comparable. For tidal floodplains the balance of disparity is again towards the poorer deciles.

This evidence of inequality provides a first view of national patterns of floodplain occupation in relation to social deprivation but has to be set against the limitations of the indicative floodplain maps. These in particular take no account of flood defences.

In making recommendations, we focus on the need to undertake further analysis when improved mapping products are available, including examination of the equity of past investment in flood protection. We also identify implications for climate change policy, given the association between tidal flood risk and deprivation, and for the targeting of flood management resources on deprived and therefore more vulnerable populations.

Integrated Pollution Control Sites and Deprivation

The IPC analysis utilised data from the Agency pollution inventory as well as the Operator Performance and Risk Appraisal (OPRA scores).

For England there is strong evidence of a socially unequal distribution of IPC sites and associated potential impacts.

- Wards in the most deprived decile providing the location for five times as many sites and authorisations and seven times as many emission sources as wards in the least deprived decile. Out of the 3.6 million estimated people living within 1km of an IPC site, there are 6 times more people from the most deprived decile compared to the least deprived.
- IPC sites are also disproportionately clustered together in deprived wards. As site and emission clusters become more concentrated, the bias towards the more deprived deciles becomes more acute.

- All of the key industrial sectors in the IPC regime show a bias towards the more deprived deciles, with the differential in the waste sector particularly extreme.
- Higher hazard authorisations (as judged by OPRA scores) are more prevalent in the more deprived deciles in absolute *and* relative terms, whilst lower hazard authorisations are more evenly distributed. There are also disproportionately more authorisations with 'offensive characteristics' in the more deprived deciles.
- Operator performance (as judged by OPRA scores) shows no variation with deprivation. There is also no difference in social profile between earlier and more recent authorisations under IPC - evidence which counters the possibility that developers may be targeting deprived communities, but also suggests that historic patterns are being maintained.
- Analysis of emission levels from IPC sites for particulates and carcinogenic emissions to air, show a disproportionate concentration of emissions in more deprived areas. Nitrogen dioxide emissions are less skewed.

For Wales, the analysis is less clear cut and, in contrast to England, there is some evidence of bias towards more affluent areas

- The analysis of populations within 1km shows a weak bias towards the more deprived deciles, but not the *most* deprived. There is no evidence of sites being disproportionately clustered in the more deprived deciles – indeed as the number of sites within 1km increases a small bias towards the least deprived decile emerges.
- Industrial sector data shows different patterns across the sectors. There are biases towards more deprived deciles for chemical, fuel and metal sectors, and towards less deprived for mineral, waste and other industries.
- The OPRA data for pollution hazard and operator performance shows no relationship with deprivation.
- Analysis of specific substances shows higher emission levels for nitrogen dioxide, particulates and carcinogens in the less deprived deciles

Our results shows evidence of distinct inequalities particularly in England where there is a strong association with deprivation. However, the analysis is of population proximity not of specific exposures to hazard or risk, and we have only touched on issues which may help explain why these patterns of inequality exist. Relevant factors and potential responses therefore need to be debated within and beyond the Agency. Issues include implications for future siting and land use policy, compensation strategies, equity information provision and stakeholder engagement.

In making recommendations we identify a number of specific potential responses. These include the targeting of regulatory attention on IPC sites in

deprived areas, giving attention to cumulative pollutant impacts associated with site clusters, working with planning authorities on potential siting implications, and developing equity appraisal techniques. We also identify a substantial profile of further research needs.

Air Quality and Deprivation

The air quality analysis addressed five pollutants: nitrogen dioxide (NO₂), fine particulates (PM₁₀), sulphur dioxide (SO₂), carbon monoxide (CO), and benzene. We also developed a simple air quality index to collectively address multiple pollutants.

- For England, overall and for all pollutants, the most deprived wards are clearly those with highest pollutant concentrations. The social distribution of NO₂ is typical, showing that people in deprived wards are exposed to concentrations higher (by 41%) than those of wards of average deprivation.
- For all pollutants (except SO₂) the *least* deprived also experience concentrations that are above those for people of average deprivation, although the elevation above the average is much less than that of the most deprived.
- The relationship between poor air quality and deprivation in England is particularly strong for peak pollutant values, including exceedences of standards. The number of people in wards above pollution thresholds increases progressively with increasing deprivation.
- For Wales, both the most and least deprived wards experience above average pollutant concentrations. However, concentrations are highest in the *least* deprived wards, although the distribution is, overall, more equitable than for England.
- The difference between the Welsh and English patterns arises because the least deprived households in Wales tend to be more urban than their English equivalents, and are mostly located in S E Wales where most of the poorest air quality occurs.
- Using the air quality index we were able to identify clusters of wards that have poor aggregate air quality and high deprivation. We identified around a dozen of these pollution-poverty 'hot-spots', with large clusters in parts of London, Manchester, Sheffield, Nottingham and Liverpool and small clusters elsewhere.

To examine future likely changes in air quality-deprivation patterns we used forecast air quality data for 2010 (NO₂ and PM₁₀).

- The 2010 data suggests that whilst the total burden of air pollution will fall, there will be little change in its social distribution. However, if we examine just those wards where air quality exceeds standards (areas which give most cause for concern) we see that the distribution becomes more equitable. The

planned introduction of tighter air quality standards may lead to an increase in exceedences, and the burden of these will be borne disproportionately by the poor, although the total exposure for all will be very much less.

In interpreting and responding to this multidimensional evidence of inequality we identify several key questions around 'polluter pays' (do the better off also create more pollution?) and the degree of choice available in residential location.

Specific recommendations focus on the Agency working with local authorities to improve air quality within designated Air Quality Management areas and within pollution-poverty hotspots; and the need for the development of equity assessment methods for assessing the distributive effects of transport and land use policies.

Conclusions and Overall Recommendations

We have produced substantial evidence which shows, for three key areas of Agency responsibility, that a greater burden of potential environmental impact is borne by deprived populations than by the more affluent. This relationship is most acute for tidal flooding, air quality exceedences (in England) and proximity to IPC sites (in England).

We have also produced more limited evidence of inverse relationships where a greater burden is borne by the affluent, in particular for the worst air quality in Wales and for fluvial flooding in England. We have therefore been able to add to the evidence-base and provide an initial foundation for further research and policy development.

In addition to specific actions in each areas, we recommend, as a stimulus to debate in relatively uncharted policy territory, that the Agency should:

- continue to support efforts to further understand the nature and significance of the social distribution of pollution and risk;
- appoint a technical working group on environmental equity appraisal;
- work with government, local authorities, and other appropriate stakeholders to ensure that environmental equity assessment becomes more widely adopted in the environmental impact appraisal process;
- identify critical 'pollution-poverty' areas so as to identify those communities most in need of remedial action;
- develop ways of engaging and working with communities in deprived areas to ensure that their local knowledge and viewpoints are included in decision-making;
- undertake further research examining additional environmental and social variables, processes of causation and the effectiveness of potential intervention strategies.

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1 THE RESEARCH PROJECT

This report describes work completed under Environment Agency contract 12615 on Environmental Quality and Social Deprivation Data Analysis. The aim of the research was to *'improve the Environment Agency's understanding of the relationship between environmental quality and social deprivation in order to inform the Environment Agency's policy position on environmental equality'*. The objectives of the study were (contract specification, p1) to:

- (i) Evaluate existing data and research for the relationship between environmental quality - particularly with reference to the Agency's environmental priorities (e.g. air and water quality, flooding) and social deprivation (as measured by the index of social deprivation);
- (ii) Identify gaps in the current evidence base, which restrict the development of an Agency policy on environmental equality;
- (iii) Critically appraise the existing methodology used by the Environment Agency for exploring the extent to which environmental conditions vary across socially deprived wards (as identified by the index of multiple deprivation);
- (iv) Identify the value of, and priorities for, more detailed quantitative analysis of environmental data sets and propose appropriate methodologies for conducting this analysis;
- (v) Conduct an initial statistical analysis of data sets associated with areas for which the Environment Agency has regulatory responsibility and those relating to deprivation; and
- (vi) Make appropriate recommendations for Agency policy responses and further research.

The project was structured in two main phases. Phase I covered the first four objectives and was concluded by a stakeholder workshop attended by Environment Agency staff, and representatives of government, NGO's and academics with interests and experience in environmental equity. The workshop proceedings are reported in Chalmers (2003) and summarised in the Phase I project record (Mitchell and Walker, 2003). The workshop was held to review the Phase I research findings and agree a strategy for the empirical analyses undertaken in Phase II, results of which are reported in full in Walker *et al.* 2003.

This technical report summarises the outcome of both phases of the project. The development of the environmental equity agenda is first briefly reviewed, after which each of the project objectives are addressed in turn. The empirical analysis focuses on three areas of concern to the Agency: flood hazard, industries regulated under Integrated Pollution Control (IPC), and air quality.

2 THE ENVIRONMENTAL EQUITY AGENDA

Environmental protection and social justice, two of the fundamental tenets of sustainable development, are brought together by 'environmental equity' or 'environmental justice' (EJ), concepts of growing interest to researchers and policy makers. The EJ approach was pioneered in the USA by civil rights activists concerned that landfills and polluting industries were invariably sited within predominantly black communities (Bullard, 1990). EJ is now an important part of environmental and public health policy assessment in the USA, mandated by a Presidential Executive Order (12898) requiring Federal agencies to address EJ as part of their overall mission (Wilkinson, 1998).

In neither the UK nor Europe more widely is there an EJ movement to compare with that of America. However, new European Community laws on enabling rights will ensure that environmental equity issues are taken more seriously than ever before. These laws are being driven by the 1998 Aarhus convention (UNECE 1999), a pan-European treaty that aims to give substantive rights to all EU citizens on public access to environmental information, public participation in environmental decision-making, and access to justice in environmental matters.

In the UK, the relevance of environmental equity to the sustainable development agenda through integrating environmental and social objectives has been increasingly recognised, driven in part by NGO advocacy (e.g. Friends of the Earth, Capacity Global, Green Alliance, Black Environment Network). There is growing political and governmental attention being given to environmental equity issues within, for example, the UK Sustainable Development Strategy and the Neighbourhood Renewal Strategy and in the work of the Environment Agency, Sustainable Development Commission and Social Exclusion Unit.

It is important to note that these emerging policy interests have different social and environmental foci to those of the USA, with a more encompassing framework (Stephens *et al.* 2001) and a reduced emphasis on civil rights. Emerging UK EJ activism and research is addressing access to a broad range of environmental resources, including physical needs (shelter, warmth, food, clean air and water); economic needs (transport infrastructure, access to work and services); and aesthetic, mental and spiritual needs (such as quiet and access to the countryside). The Environment Agency's involvement in environmental equity issues therefore needs to be approached as part of a broad cross-governmental agenda of relevance to a wide range of stakeholders.

3 REVIEW OF KEY LITERATURE

The first objective of the project was to evaluate existing research on the relationship between environmental quality and social deprivation, particularly with reference to the Agency's environmental priorities.

Given the breadth of potentially relevant environmental issues, and the complexity of the issues involved in environmental equity appraisal, we concentrated on reviewing UK research. A wide ranging general literature search was conducted, followed by a more detailed review and synthesis addressing eight environmental issues for which some prior research has been conducted. These issues were: air quality, potable water quality, point source emissions and wastes, major accident hazards, contaminated land, flood hazard, surface water quality and noise.

Of the environmental themes we reviewed, only those relating to air quality and point source emissions and wastes (IPC and landfill sites) provided more than one or two UK studies. These studies represent a small and heterogeneous body of research from which it is difficult to draw any firm conclusions as to the degree of environmental inequality. In the case of air quality, which has perhaps received most attention to date (e.g. Brainard *et al.* 2002, McLeod *et al.* 2000, Mitchell and Dorling 2003), the studies address a variety of pollutants, study areas, geographical units of analysis and analytical methodologies which means that no definitive conclusion can be drawn, although the balance of the evidence suggests that deprived communities do bear an above average cost of poor air quality.

For point source emissions and wastes the findings of equity studies appear to show a fairly consistent relationship with deprivation (Friends of the Earth 2000, 2001). However the proximity-based methodologies applied to-date are simplistic and the robustness of these results has not been tested through the application of different scales and methods of analysis.

The limited coverage and depth of UK studies means that the empirical evidence for environmental inequality is rather limited. To date, there have been no attempts to firmly establish the causal mechanisms through which inequalities may have arisen, largely because emerging research is logically engaged in establishing the extent of existing environmental inequalities in the UK. We could also identify no thorough attempts to evaluate observed inequalities within a justice framework (i.e. an appraisal of whether observed inequalities are fair or acceptable) or to evaluate inequality with respect to multiple parameters (cumulative inequalities).

All of the research reviewed had followed a strongly positivist approach, although other methods of participative engagement with communities on equity issues are beginning to emerge.

4 EVIDENCE BASE 'GAP ANALYSIS'

The second objective of the project was to build on the literature review to identify gaps in the current evidence base which restrict the development of Environment Agency policy on environmental equality.

The first step in undertaking the gap analysis was to construct and refine a fully inclusive list of environmental issues potentially appropriate for equity analysis. These issues were identified from four key sources: an academic literature search; grey literature search; the Environment Agency's strategic objectives expressed by 46 targets across 8 theme areas (Environment Agency, 2003); and a range of government publications on national and local sustainability, quality of life and 'best value' indicators.

The resulting list of environmental issues derived from these sources was structured under four headings:

- Exposure to environmental impact (i.e. the distribution of environmental costs) e.g. air pollution and flood risk;
- Access to environmental resources (i.e. the distribution of environmental benefits) e.g. access to greenspace, energy, water and shelter;
- Ability to influence decisions affecting the environment e.g. community involvement in participatory processes, education and understanding of sustainable development;
- Justice to the environment (i.e. distribution of environmental costs and benefits between anthropogenic and ecological users) e.g. biodiversity value, SSSI status.

Having constructed a wide ranging and inclusive list of environmental issues we then began to refine the full list. An important initial filter was to ask 'is the variable a relevant equity concern within the context of this project?' This was applied because the project is focused on the relationship between environmental quality and social deprivation. It therefore has an anthropogenic focus on people and also requires that people can be meaningfully characterized in terms of spatially derived measures of social deprivation. This filter therefore excluded all of the 'justice to the environment' category and a number of other environmental issues without a sufficiently direct linkage to groups of people for whom an equity analysis could be conducted.

Having refined the initial list 33 variables addressing 12 theme areas remained. For each of these we then examined:

- whether or not the variable was a direct measures of an environmental concern or a surrogate. This revealed that in very few cases are direct measures available and that most variables are surrogates of varying quality;
- the nature of the population group with which the variable could be linked for equity analysis. This was necessary to consider as, in some cases, the population group is spatially defined and social characteristics are therefore

accessible through census data or similar. In others, the population group concerned is not defined spatially but is defined by a particular pattern of use of the environment or pattern of impact;

- The extent to which the environmental issue had been addressed in UK equity research, as informed by the literature review;
- the availability of environmental data (although a thorough appraisal was not possible at this stage of the project).

Having undertaken the literature review and constructed the list of relevant environmental equity issues we were able to conclude that there were significant gaps in the UK evidence base. The prioritisation of further research to begin to address these gaps is discussed in section 6 below.

5 METHODOLOGICAL ISSUES

The third objective of the project was to critically appraise the existing methodology used by the Environment Agency for exploring the extent to which environmental conditions vary across socially deprived wards. In order to achieve this, we felt it appropriate to first review key methodological issues in empirical environmental equity analysis. In doing so we drew heavily on experience from the USA where there is a longer history of environmental equity appraisal.

5.1 Generic Methodological Issues

Whilst methodological questions have been aired at length in the US literature, only recently have academics started to thoroughly and critically appraise the body of empirical environmental justice research conducted over the past 20 years (Bowen 2003, Liu 2002). Overall, such appraisals have concluded that the evidence for environmental injustice in the USA is less substantive than often thought. The main problems cited are a general lack of empirical research, a focus on proximity based analysis, a poor quality of analysis and a failure to be clear about methodological limitations.

We addressed nine methodological complexities associated with equity studies:

- data quality and availability;
- impact assessment, particularly the distinction between proximity and risk;
- selection of appropriate target population groups;
- spatial analysis difficulties, including selection of appropriate spatial units;
- assessing cumulative impacts;
- statistical assessment of inequality;
- understanding causality;
- assessing injustice; and
- communicating with stakeholders.

Whilst this list of methodological complexities is substantial it is important to note that such complexity is not an uncommon feature of both environmental and social science research. The task is to find a pathway for undertaking meaningful analysis that is 'fit for purpose', operating within data and resource constraints, but with full recognition of the constraints integrated into the research design, and hence recognised in policy development.

5.2 Critique of the Environment Agency Equity Analysis

In September 2002, the Environment Agency carried out analysis which explored the extent to which environmental conditions vary with social deprivation for nine environmental variables. The Agency's equity analysis was published in Appendix 4 of 'Our Urban Future' and is described as an 'initial overview' of social deprivation and the environment (Environment Agency, 2002). Many of the limitations of the analysis we identified are readily acknowledged in the Agency's own discussion in Appendix 4. The primary purpose our critique, therefore, is to inform further analysis of data sets in this project.

We organised our review of the Agency analyses into in three groups: site based analyses (IPC, landfill and sewage treatment works); air quality (NO_x , ozone and PM_{10}); and river quality (aesthetic, chemical and habitat quality).

For the site based analyses, a simple analysis of proximity through measuring the density of sites within wards was provided by the Agency. We made the following methodological observations about the site analyses: it is unclear what impact is being assessed through this measure of proximity; all sites are treated equally within a category, whilst in practice they may vary in their character, physical size, level and type of emission and emission medium; the use of wards as spatial units creates several boundary problems; and that using deprivation deciles is an acceptable way of presenting results, but should preferably be based on deciles of equal population not wards.

For the air quality analyses methodological issues include: the rationale for selecting pollutants to study; the inclusion of ground level ozone as a regional scale problem; the use of annual mean standards rather than concentrations; the impact of variable ward size; and the limitations of the NETCEN grid data when used at finer spatial scales

For the river quality analyses methodological issues include the rationale for addressing river water quality within an equity frame, when, for example, it has a very indirect link with consumed water and health; the problem of assessing amenity value in terms of the characteristics of only proximate populations and when individuals assess aesthetics in different ways; the impact of large unpopulated rural areas on the analysis; and the potential distortions from relying on sampled point data sets in particular for the aesthetic and habitat quality measures.

Building on these particular critiques we identified a number of generic methodological issues for the work completed by the Agency. First, the lack of rationale for selecting the nine variables which appear to cover a mix of physiological health, psychological health and amenity impacts. Second, data quality issues and uncertainties for each of the datasets. Third, the omission of Wales from the analysis. Fourth, the lack of statistical analysis of relationships between environmental quality and deprivation and finally the need to be clearer about the ends to which an Agency equity analysis should be directed and its interface with justice theory.

6 FURTHER EQUITY ANALYSIS

The fourth objective of the research was to identify the value of, and priorities for more detailed quantitative analysis of environmental data sets and to propose appropriate methodologies for conducting this analysis. This part of the project incorporated a stakeholder workshop held in Bristol involving a range of internal and external stakeholders, the latter including representatives from government departments, environmental NGOs and academics.

6.1 The value of equity analysis

We identified four key reasons why further analysis of the status of environmental equity in England and Wales is required.

First, whilst there is some evidence to support the common belief that socially excluded communities are located in areas where environmental quality is lowest, the UK evidence base for this belief is generally weak. As pressure from civil society to address perceived environmental inequalities is growing, it is important to understand the nature and extent of any such inequalities. The key value of further research is then to address primary knowledge gaps.

Second, research addressing environmental inequality provides one mechanism where sustainable development objectives may be integrated, and hence add value to each other, mutually advancing and reinforcing social and environmental agendas. There are compelling reasons for the Agency to link the analysis of environmental equity to wider policy developments focusing on inequality and social exclusion across government, for example, in the areas of health and regeneration.

Third, there are growing pressures on the Environment Agency to address equity issues. These pressures are both legislative and political. By developing further research in the environmental equity area, the Agency have a means to a wider more inclusive dialogue with stakeholders which could usefully seek to establish common ground on goals, methods, and responsibilities.

Fourth, there is a moral case for tackling environmental inequality, but there are different views as to what constitutes an acceptable degree of inequality. In other words at what point *inequality* becomes *inequitable or unfair*. The extent to which environmental inequality is considered unfair is not a technical issue. Further research on the current status of inequality in the UK is however a prerequisite to inform this important debate.

6.2 Priorities for further equity analysis

It was clear from the review and gap analysis that there is a substantive research agenda which is beyond the scope of this project to fully address. It was therefore necessary to develop priorities for data analysis based upon what was practical within the timescale and resource commitment of the project.

Identifying issues to take forward to the next phase was an iterative process. Firstly in terms of identifying issues (an iteration between the research team, the workshop stakeholders and the project board) and in terms of identifying issues for which data of adequate quality was available. Our initial prioritisation of the issues to address was based on three criteria: (a) rationale and significance of the analysis; (b) the relevance to the remit of the Environment Agency; and (c) the availability of sufficient data of adequate quality for a meaningful and scientifically robust analysis. In terms of the first of these criteria we adopted a broad ranking of issues emerging from the gap analysis which in order of priority are:

- Agency obligations re enforcement;
- Breaches of environmental standards;
- Parameters relevant to public health (but where standards may not be exceeded);
- Vulnerability to threat;
- Other variables including those addressing amenity and economic impact.

On the basis of our own appraisal we used the gap analysis discussed earlier to propose issues that were of high, medium and low priority for further environmental equity analysis (see below). These proposals were presented at the stakeholder workshop where they were discussed at length (see full workshop report in Chalmers 2003).

Issues of high priority for further equity analysis

- National Air quality standards (NAQS standards exceedences - variables selected on basis of frequency of exceedence);
- Air quality (Concentration of NAQS pollutants - to be selected);
- Potable water quality standards % compliance failure (all and/or parameter specific);
- Flood Hazard;
- Proximity to polluting sites (Including IPC sites and waste incinerators);
- Proximity to major accident hazard sites;
- Pollution incidents;
- EA permits : prosecutions, cautions and compliance;
- Facility inspection rates.

Issues of medium priority for further equity analysis

- Noise
- River water quality (aesthetic)
- Coastal water quality
- Access to green space
- Contaminated land
- Proximity to landfill
- Locally unwanted land uses not covered elsewhere (roads, sewage treatment works, pylons etc.)

Issues of low priority for further equity analysis

- Odour

- River water quality (chemical & biological)
- Contaminated land clean ups
- Local environmental quality
- Biodiversity (plants, birds)
- Planning applications approved against EA advice
- Sustainable development awareness and training programmes
- Community participation in EA participatory initiatives.

6.3 Environmental Agency Environmental Equality Workshop

The Environment Agency hosted an environmental equality workshop, attended by Agency staff, government, NGO's and academics, to consider the Phase I research (see proceedings in Chalmers 2003), and provide guidance on the scope of the second analytical phase, and on the Agency environmental equality programme more widely.

The workshop began with a series of presentations by Environment Agency staff. Peter Madden (Head of Environmental Policy) discussed drivers for addressing environmental inequality, including government policy, the rise of inequalities, and the Agency's commitment to equality, as expressed in the corporate vision. Dr John Colvin (Social Policy Manager) introduced the Agency's work on environmental equality, including the Agency's AGM on 'Achieving Environmental Equality' in September 2000, the Mapping Common Ground event in September 2001, and the initial analysis presented in 'Our Urban Future' (Environment Agency, 2002). Helen Chalmers (Social Policy Development Officer) described the proposed programme for developing the Agency's research, policy and action on environmental equality. The research team then made presentations on the evidence base for environmental inequality, and proposals for further research addressing objectives (i) to (iv) of the project (see sections 1 - 6 above).

Following the presentations, delegates met in small group and plenary sessions to discuss environmental equity research and policy needs. The sessions aimed to map the evidence base for environmental inequality in England and Wales; identify the value of and priorities for further research; and to design and agree the process for the research beyond Phase II (see Chalmers 2003). The key conclusions and recommendations of the steering were:

- More research is required to underpin policy and practice. Research should address a wider range of environmental issues (including those not the prime responsibility of the Agency), cumulative impacts, 'hot spot' areas, health outcomes, and evolution of observed inequalities. Agency policy and practice should not to be restricted by a lack of empirical evidence, but should take a precautionary approach;
- Improved tools for examining the distributional effect of policies and processes are required, as well as further debate on the nature of 'what is fair';
- Accessibility and participation of local communities is important in promoting environmental equity. Linking local experiences to national analyses, policy

and process can improve understanding of inequalities, lead to better responses, and ensure that the Agency maintains the trust and confidence of excluded communities;

- The benefits to the Agency of further environmental equality research are: (a) a greater evidence base for environmental inequality; (b) identification of opportunities for mutual improvement of the environment and quality of life for excluded communities; (c) a proactive Agency response to growing legislative and political pressures to address poor environmental quality, urban renewal, poverty and inequality; (d) the Agency's ability to champion these issues and influence policy of government, the EU and other agencies and partners; and (e) an opportunity to build relationships and dialogue with new audiences, organisations and excluded communities.
- Phase II of the current project should focus on the relationship between social deprivation and issues for which the Agency has regulatory responsibility and an ability to deliver change. Three 'benchmark' or politically important environmental issues (identified as high priority issues under phase I were recommended for further detailed analysis: air quality, flood hazard and IPC sites.

7. INTRODUCTION TO THE EQUITY ANALYSES

7.1 Environmental issues addressed

The fifth objective of the project was to conduct an initial statistical analysis of data sets associated with areas for which the Environment Agency has regulatory responsibility and those relating to deprivation.

The outcome of the stakeholder workshop (Chalmers 2003) was to recommend that we focus the data analysis within the remainder of the project on just a few environmental equity issues, carrying out this analysis in some depth, rather than a more superficial analysis of a broader range of issues. Three specific issues from our high priority list were identified as particularly relevant to the remit of the Agency and most appropriate for analysis within this project:

- Flood hazard;
- Integrated Pollution Control sites; and
- Air quality.

Whilst limited to three issues, the analysis we have undertaken in fact incorporates at elements of at least seven of the nine high priority issues we identified prior to the workshop. Our air quality analysis covers both concentrations and exceedences, whilst the IPC analysis includes indicators relevant to incidents, Agency enforcement and inspection priorities. The scope of the analysis undertaken for each environmental issue is as follows:

7.1.1 Flood Hazard

Indicative floodplain maps produced by the Agency were used to relate to ward deprivation data. These maps show 1 in 100 year peak water level return periods for rivers and 1 in 200 year floods for coasts or the highest known water level. Whilst these are currently the best available national floodplain maps they have significant limitations as indicators of flood hazard or risk (see section 8.4). A sophisticated method has been used to ensure that only the population within wards that is also within the indicative flood area is counted within this analysis. Many wards will have rivers running through their area but no people actually living within the indicative flood hazard area, particularly in rural wards. Results are reported which show the percentage of population for each deprivation decile that lives within indicative flood hazard areas.

7.1.2 IPC Sites

The spatial distribution of IPC sites has been evaluated against deprivation using two different methods – 'spatial coincidence' which counts the number of sites with grid references falling within different wards and population proximity which uses a buffer distance around each site to characterise the location of the site. As well as counting sites we have also used data on number of authorised processes and emission sources at each site. We have also introduced differentiation into the analysis by examining patterns with deprivation within different industrial sectors, for emissions to air alone, for specific substances (NO₂, PM₁₀) and groups of substances (carcinogens) and for authorisations approved at different dates. The Agency Operator Pollution and Risk Appraisal (OPRA) scores for authorised processes have also been used to take account of

the different level of pollution hazard from each process and the performance of site operators. The IPC datasets utilised are for 2001 and required careful verification and 'cleaning' particularly in relation to producing reliable site counts.

7.1.3 Air Quality

Five variables have been analysed using 2001 annual mean data available on a 1km² grid: NO₂, PM₁₀, SO₂, CO and benzene. Two of these variables NO₂ and PM₁₀ have also been analysed for predicted levels in 2015, in order to assess how the expected changes in concentration differentially affect more or less deprived groups. As well as analysing annual mean concentrations we have conducted separate analyses of exceedences of standards. In addition to single pollutant analyses we have attempted to identify the cumulative inequity pattern through application of an air quality index.

7.2 Social Data Sources, Analysis and Presentation

The specific techniques used to conduct the equity analyses vary for each of the three key issues addressed, and hence are described in the appropriate chapter. However, all the analyses have a number of common features, described here.

First, the spatial unit of analysis used for social data is the census ward, of which there are 8,414 wards in England and 865 in Wales. Wards are designed to contain roughly equal numbers of electors within local authority districts, thus ward size is density dependent, with small wards in urban centres and large wards in rural areas.

Second, deprivation was represented using the Index of Multiple Deprivation 2000 (IMD 2000) (DETR 2000). This has become the most widely used official data set on deprivation and was identified in the project tender document as the indicator that the Agency wished us to use. The IMD is based on six separate domains (income, employment, health deprivation and disability, education, skills and training, housing and geographical access to services), addressed by 33 separate indicators.

For each ward a score is produced for each indicator and then domain, and domain scores standardised to a uniform metric by ranking and applying an exponential transformation. Individual domain scores are then weighted and summed to create an overall score, which forms the basis for the final ranking of wards by deprivation (DETR, 2000). This procedure ensures that bias in the identification of deprivation is minimised as far as possible. Note, however, that because of the method of calculation, a ward with an IMD rank of 100 is not necessarily twice as deprived as a ward with a rank of 200. For this reason we uniformly present the deprivation data in this project in the form of deciles which maintain the ranked ordinal form of the data.

The calculation method also precludes combination of the IMD 2000 data sets for England and Wales which were derived separately. *An index value for a ward in Wales can not be taken as equivalent to the same index value for*

England. For this reason we have throughout the analysis had to consider Wales separately from England.

Third, we used ward population data obtained from the Neighbourhood Statistics Branch of the Office for National Statistics. The population data are mid 1998 estimates for wards in England and Wales relating to 1998 ward boundaries and rounded to the nearest 100. The data are preferred to 1991 census data as our environmental data is much more recent, and observed data from the 2001 census were not yet available.

Fourth, we routinely present results using deprivation deciles. In order to create ward deprivation deciles, data were ranked in terms of deprivation, and the deprivation ranked wards placed into deciles of equal population. These are preferred to those of equal ward count as the analysis then gives a population based, not area based distribution of environmental quality, which is more meaningful for this purposes of this study. In all cases, decile 1 is the most deprived and decile 10 the least deprived.

Finally, we have chosen to analyse the data using simple statistical measures and indicators of inequality. There are no standard methods for analysing environmental equity issues. Of the methods most widely used to relate social and environmental data, we rejected both regression and correlation. Regression requires a well specified model supported by data on explanatory variables for the nation at ward level. This is the basis of a causality study, and is beyond the scope of this scoping project. Parametric correlation was rejected as the index of deprivation data is ranked, and ordinal data cannot be used with parametric tests. Non-parametric correlation tests could have been used but are generally weak tests and problematic for some of the data (e.g. for air quality there is a significant tied observation problem and a curvilinear relationship with deprivation not improved by data transformation). We did not conduct tests of differences between deciles (e.g. Z-tests on means) as such tests are used to make inferences about a population from a sample. We were in the unusual, but fortunate position of having access to the entire population data, hence inferential tests are not necessary. Our analysis was therefore simple, but powerful.

We have for some of our analysis calculated 'concentration index' (CI) values to provide a comparative statistical indicator of inequality. The CI is closely related to the Gini coefficient which has been widely adopted as a measure of income and health inequalities (Wagstaff *et al.* 1991) and also recently applied to environmental equity research (Lejano *et al.* 2002). The concentration index ranges in value from 1 to -1. A value of 0 indicates complete equality (so that, for example, for our application the proportion of the population within floodplain area would be identical for all deprivation deciles) whilst values of 1 and -1 indicate extreme inequality in positive or negative relationships with deprivation. The CI does not provide an indicator of the *significance* of inequality which will always be an ethical and political judgement and is best used in a comparative setting (see e.g. section 10.5 that compares air quality in 2001 to that in 2010). It is useful to note however that values for income inequality in the UK over the period from 1979 to 2001 have ranged from 0.25 to 0.35 (Shephard, 2003).

Each of the analyses we have undertaken inevitably has limitations arising from the quality and resolution of source data sets, the spatial scale at which analysis has been undertaken and the complexity of real world environmental variables which can only partially be captured. We have undertaken an environmental equity analysis which is as advanced methodologically as any existing national scale work in the UK and on a par with the better quality research undertaken in the US. However, in the discussion that follows we have sought to be fully open about the limitations of analysis and, where necessary, cautious with the conclusions that can be reasonably be made.

8 FLOOD HAZARD AND DEPRIVATION

8.1 Introduction

Flooding is a key area of responsibility for the Agency, which has a statutory responsibility under the 1991 Water Resources Act to identify areas that are at risk from flooding. The need to incorporate social vulnerability into the flood hazard appraisal process has been increasingly recognised and a number of steps have been taken to develop social vulnerability maps incorporating a range of demographic and social variables. However, to our knowledge, no research has been conducted that specifically assesses the demographic characteristics of populations within UK flood hazard areas from an equity perspective.

8.2 Flood hazard and deprivation in England

At first sight there appears to be a general relationship between deprivation and the proportion of the population in wards in each decile living within a floodplain in England (Figure 8.1). Of the population living in a floodplain 13.5% are in the most deprived decile, compared to 6.1% in the least deprived decile, and the concentration index value of 0.14 indicates a weak bias towards the deprived deciles.

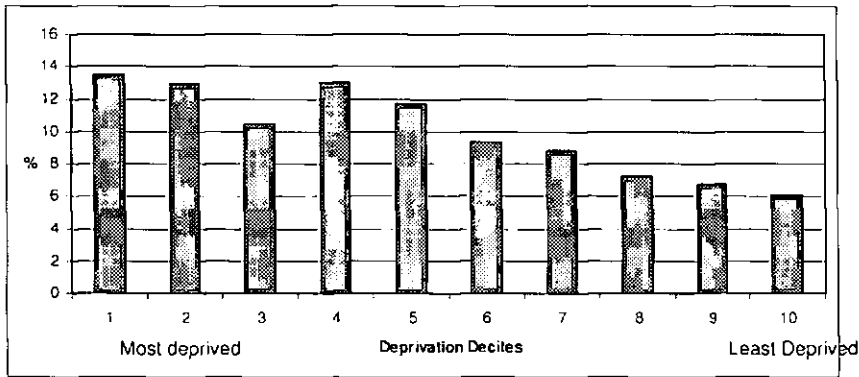


Figure 8.1: Percentage of population living in a floodplain by population weighted ward deprivation decile for England (Concentration Index = 0.14)

However, when the data is disaggregated into fluvial and tidal floodplain populations (Figures 8.2 and 8.3) it becomes clear that the overall relationship with deprivation observed in the aggregated data is attributable entirely to the tidal floodplain element. For the tidal floodplain there is a clear relationship with deprivation with a more marked tailing off in the least deprived deciles. Of the population living within the tidal floodplain 18.4% are in the most deprived decile compared to only 2.2% in the least deprived. The proportion of the population in the floodplain in the most deprived decile is eight times that of the least deprived decile, and the CI value of 0.33 indicates a substantial inequality. In contrast, for the fluvial floodplain there is an inverse relationship with deprivation, although of lesser strength (CI value of -0.11), with a higher proportion of the population within the floodplain in the less deprived compared to the more deprived deciles. Only 13% of the population within a fluvial

floodplain comes from the 20% most deprived wards compared to 22% from the 20% least deprived.

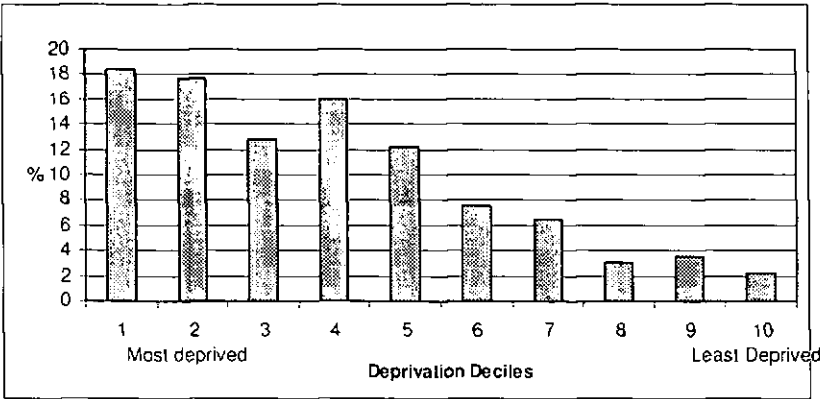


Figure 8.2: Percentage of population living in a tidal floodplain by population weighted ward deprivation decile for England. (Concentration Index = 0.33)

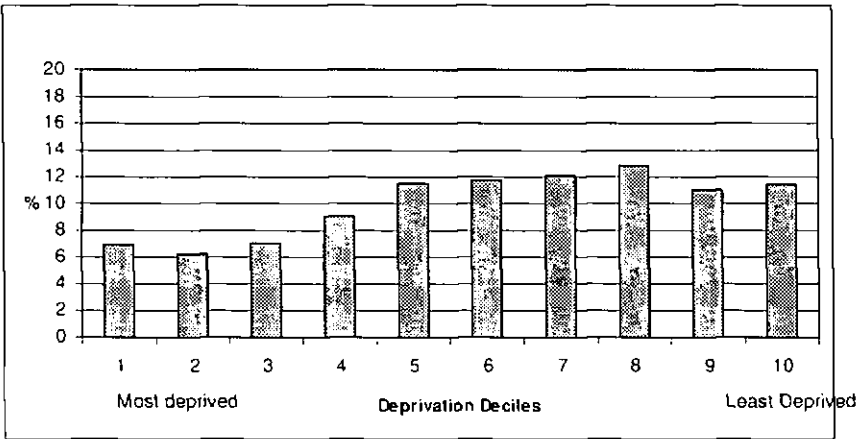


Figure 8.3: Percentage of population living in a fluvial floodplain by population weighted ward deprivation decile for England. (Concentration Index = -0.11)

8.3 Flood hazard and deprivation in Wales

The pattern of social distribution of floodplain populations in Wales is less distinct but shows some similarities to England (Figure 8.4). The overall floodplain population is most concentrated into deciles 3 and 5. Comparing quintiles the most deprived 20% has 17.9% of population within the overall floodplain compared to 7.9% in the least deprived decile, indicating a bias towards deprived wards. The CI value of 0.15 is similar to that for England but the focus of the disparity is less orientated towards the most deprived deciles.

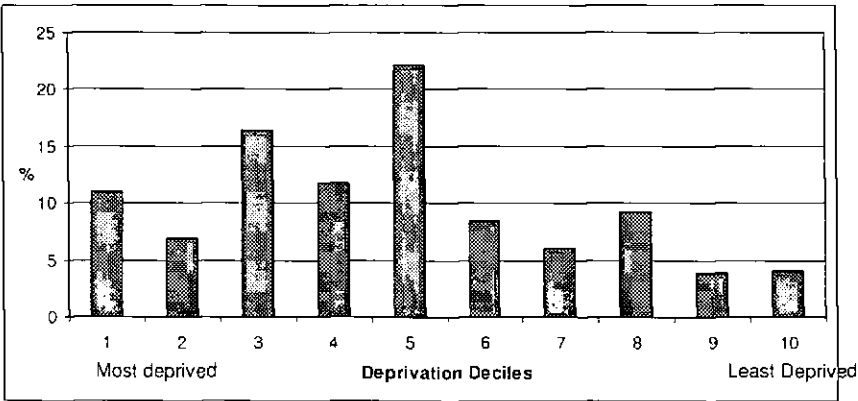


Figure 8.4: Percentage of population living in a floodplain by population weighted ward deprivation decile for Wales (Concentration Index = 0.15)

After disaggregation into fluvial and tidal areas the patterns against deprivation (Figures 8.5 and 8.6) become complex. For fluvial floodplains there are peaks in deciles 3 and 5 whilst the proportions in the least deprived and most deprived deciles are very similar. The Cf value of 0.09 indicates a low comparative level of inequality, but no overall bias towards the *less* deprived deciles as in England. For tidal floodplains there is a peak in decile 5, but the proportion in the most deprived decile (14.9%) is much higher than in the least deprived (1.6%). The balance of disparity is towards the more deprived deciles (1-5) although the CI value of 0.21 is not as strong as for England.

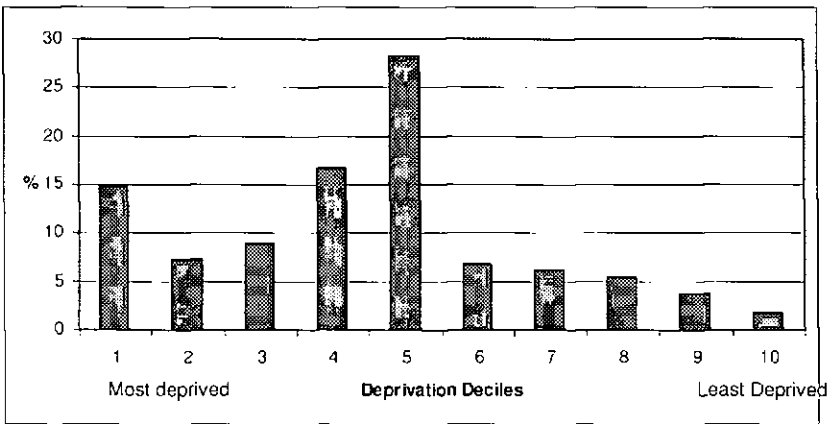


Figure 8.5: Percentage of population living in a tidal floodplain by population weighted ward deprivation decile for Wales. (Concentration Index = 0.21)

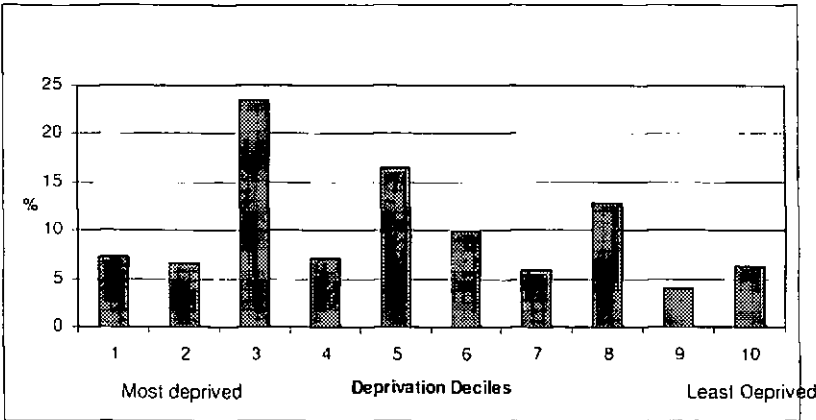


Figure 8.6: Percentage of population living in a fluvial floodplain by population weighted ward deprivation decile for Wales. (Concentration index = 0.09)

8.4 Discussion of Flood Hazard Equity Analysis

The analysis we have undertaken provides a first broad view of national patterns of floodplain outlines against social deprivation. It has made use of the Indicative Floodplain Map (IFM) produced by the Agency and publicly available over the Internet. Whilst the best available floodplain map for England and Wales, it has a number of key limitations. Most crucially it takes no account of flood defences and therefore presents a precautionary view of the area potentially at risk from flooding. The floodplain outlines indicate where flooding from rivers, streams, watercourses or the sea is possible but do not provide an indication of the level of risk (which will be higher in undefended low-lying areas near rivers or the sea and lower in areas where flood defences offer some protection) or the hazard which is dependent on factors such as velocity and depth of flow.

The social equity patterns revealed in the data for England and Wales are in part predictable and in part more surprising. That fluvial floodplain populations show some weak bias in England towards the more affluent deciles is to be expected given that much of the floodplain area is rural rather than urban in character and rural wards are generally more affluent than urban wards. Riverside locations generally also have a premium value in terms of property prices - although this very local social patterning is unlikely to be picked up in ward level data, and may serve on the ground to further accentuate the proportion of the better-off population living within fluvial floodplains.

The strong relationship between deprivation and location in tidal floodplains for England (and weaker for Wales) is perhaps less expected. Examining the pattern of distribution of the most deprived quintile (deciles 1 and 2) for England reveals the populated poor areas potentially at risk are focused on London and the Thames Estuary, Hull and the Humberhead levels, the Lincolnshire coast and Teesside; with further pockets in South Kent, various locations along the North West coastline and Tyneside. A regional breakdown of the population within this quintile particularly highlights the size of the population at risk in London

and the Thames Estuary. Of the 747,000 estimated people living within the tidal floodplain in the most deprived 20% of wards, 438,000 (59%) are in the Thames region of the Agency. For Wales, the most significant populations within deciles 1 and 2 are located in Cardiff extending northwards, near to Llanelli, various locations along the North Wales coastline and north of Deeside, Barmouth and Pwllheli.

These varying patterns of association between delineated floodplains and deprivation raise a number of questions for policy response. First, judgements need to be made as to the adequacy of the evidence of inequity we have presented, given that it is reliant on the IFM. As indicated in recommendations below, there are a number of ways in which further analysis could enhance the quality of the evidence base for Agency action and immediate policy responses may therefore be considered inappropriate. The case of tidal flooding along the Thames clearly illustrates the issues involved. A substantial proportion of the most deprived potentially flooded population is in this area, but the IMF fails to take account of the major flood protection measures already in place to protect London and upstream communities from tidal flooding.

Second, the identification of a pattern of bias in England towards *less* deprived populations living in fluvial floodplains, raises the question of the need for policy responses where environmental impacts are focused more on the prosperous than the deprived. Whilst it could be argued that an even-handed approach should involve responses to *any* evidence of inequality, a counter argument would be that those who are more prosperous are typically able to exercise greater choice as to where they live than the poor. As long as that choice is informed about flood hazard (which cannot necessarily be presumed) then the case for policy intervention may be weakened. For flooding those people with greater access to financial resources may also be more likely to have good quality insurance cover and be more resilient to flood impacts.

Third, and closely related to the last point, is the extent to which deprivation can reasonably be associated with greater vulnerability. Social vulnerability has been shown to be a multifaceted phenomenon related to factors such as community networks and social capital, as well as age and family composition (Tapsell *et al.*, 2002). The part played by deprivation may be both directly contributory, as well as being associated with other factors such as long term ill health, and thus provide a reasonable indicator of social vulnerability to flood hazard. The inequity of greater numbers of deprived people being exposed to tidal flooding potential, may therefore be seen as being compounded by the greater vulnerability they also face.

8.5 Recommendations

At the current time there are significant changes taking place in the Agency's approach to both flood mapping and flood management, many of which are recognising the social vulnerability dimensions of flood hazard. In this evolving context we can point to four recommendations for Agency action. The first three of these are largely focused on the need for further research and data analysis, the last towards broader policy priorities:

1. Over the next few years significantly more precise and complex flood mapping products are to be released by the Agency, differentiating flood potential, from flood hazard and risk within a GIS environment that includes relatively detailed postcode based information. We recommend that the Agency undertake further equity analysis using these new flood maps in order to compare the results obtained to those we have produced in this project;
2. Decisions on past flood protection investments have traditionally been driven by economic considerations which balance the cost of the investment with the estimated economic loss from flood events. This has been criticised as inequitable leading to a marginalisation of areas for flood protection which contain poor communities and only low value economic activity. We recommend that new flood maps are used to investigate whether or not populations that have been protected by flood defence investments are indeed the 'better off'. Such analysis could be undertaken at both national and regional levels;
3. The evidence that tidal flooding potential is biased towards areas of deprived population suggests that the potential impacts of increased coastal flood risk due to climate change will be felt more acutely by the poor in England and to a lesser extent in Wales. There may therefore be a case on social justice grounds for particular attention to be given to the management of future tidal flood risk in deprived areas, and more generally, an additional argument for the reduction of greenhouse gas emissions as a precautionary measure. However, given the limitations of the IFM and of the scale of analysis we have undertaken, we recommend that the Agency undertake further analysis of the social distribution of tidal flood risk in order to inform the development of climate change related policy measures. This analysis could use more sophisticated flood maps which take account of coastal flood defences (as discussed above); involve analysis of both current and future flood hazard under climate change scenarios to see how future patterns in the social distribution of hazard are likely to evolve; and incorporate a range of social variables relevant to flood vulnerability.
4. As discussed above, where there are associations between flood hazard and deprivation it can reasonably be argued that particular population vulnerabilities may exist. We therefore recommend that the Agency considers the case for targeting flood management measures towards those deprived communities that are at risk from flooding.

9 INTEGRATED POLLUTION CONTROL SITES AND DEPRIVATION

9.1 Introduction

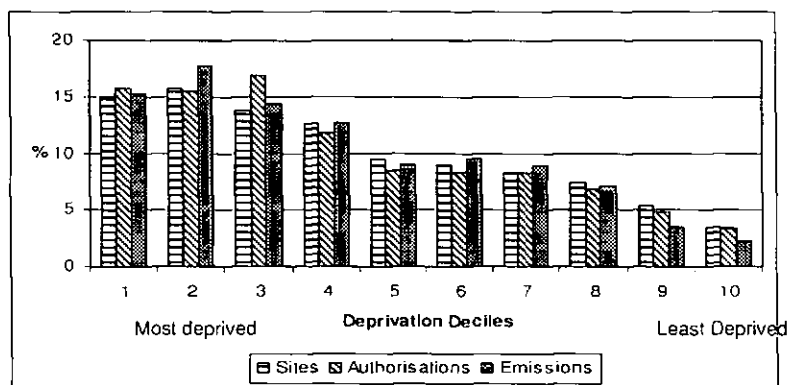
The regulation of Integrated Pollution Control (IPC)⁵² sites is a key responsibility of the Agency. Included within the remit of the IPC regime are the most substantial sources of pollution from industrial and related sources in England and Wales. Each IPC site can have multiple authorised processes operating and each process may have multiple authorised emissions. In the UK there have been three published equity studies examining IPC site locations in relation to deprivation, which have each shown a strong bias towards more deprived areas (Environment Agency 2002, Friends of the Earth 2000, 2001). The IPC analysis we have undertaken in this project has sought to significantly extend the analysis in these studies. Specific objectives include to:

- use two alternative methods for assessing spatial relationships with deprivation ('site in ward' counting and 'population proximity' analysis);
- differentiate between industrial sectors;
- undertake an analysis just for sites producing emissions to air and for levels of emission of key air pollutants;
- analyse Operator and Pollution Risk Appraisal (OPRA) scores to examine patterns of operator performance and the distribution of pollution hazard.

The key data sets used in the analysis are the Agency Pollution Inventory records and OPRA authorisation database for 2001.

9.2 IPC Sites and Deprivation in England

For sites, authorisations and emissions Figure 9.1 shows a strong relationship with deprivation, with wards in the most deprived decile providing the location for five times as many sites and authorisations and seven times as many emission sources as wards in the least deprived decile.



⁵² We have used the term IPC in this report although a transition is taking place towards regulation under the new Integrated Pollution Prevention and Control (IPPC) system. For 2001 95% of sites were still regulated under IPC.

Figure 9.1: Percentage of Sites, Authorisations and Emissions by population weighted deprivation decile for England (using 'site in ward' counting method). CI values = 0.22 (sites) 0.25 (authorisations) and 0.26 (emissions)

There are only 92 sites and 656 emission sources in the 20% least deprived wards (deciles 9 and 10), compared to 316 sites and 3782 emission sources in the 20% most deprived wards (deciles 1 and 2). As indicated by the CI values, counting sites provides the marginally weaker relationship with deprivation, whilst counting emission sources provides the strongest, indicating that the sites in the more deprived wards have a greater number of emissions per site (on average) than sites in the less deprived wards.

Undertaking a similar analysis using the 'population proximity within a buffer' method - which provides a more consistent method for characterising the deprivation characteristics of people living near to IPC sites - produces a similar but more accentuated relationship with deprivation. Fig 9.2 show populations within each deprivation decile living within two different distances from IPC sites – 500m and 1km (analysis was also undertaken for 2km and 4km buffers).

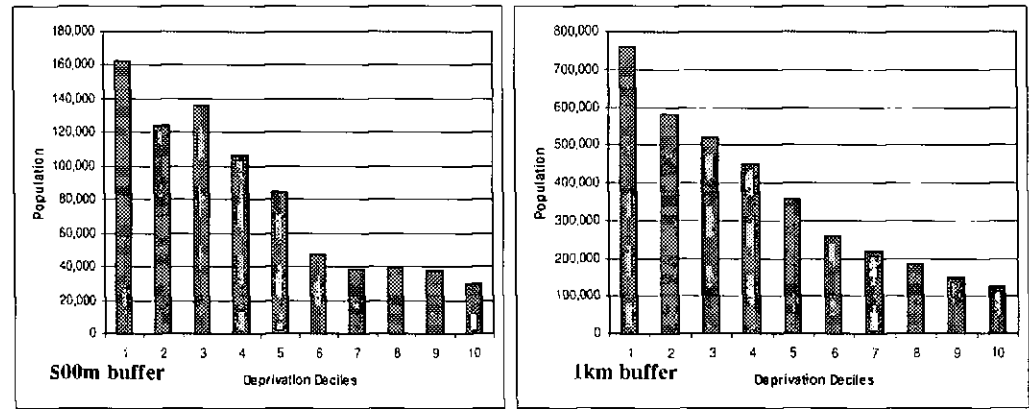


Figure 9.2: Total estimated populations living within 500m and 1km of an IPC site by population weighted ward deciles for England (CI = 0.31 for 500m and 1km)

This population proximity data produces a stronger and more consistent relationship between deprivation and site location than using 'site in ward' counts. An identical CI value of 0.31 for 500m and 1km buffers indicates greater inequality than the CI value of 0.22 for the site in ward count method. Out of the 3.6 million estimated people living within 1km of an IPC site, there are 6 times more people from decile 1, the most deprived, as from decile 10.

A further more involved analysis was also carried out to examine the deprivation characteristics of people living within 1km of more than one site (i.e. where buffers overlap). Contrasting the most and least deprived deciles in Figure 9.3 there are 159,031 people in the most deprived decile living near to 2 or more sites, and only 13,301 in the least deprived. There are no people living near to 4 or more sites in the least deprived decile, compared to 11,523 in the most deprived. As the number of sites within 1km rises the bias towards the more

deprived deciles becomes more acute – as shown by the graduation of CI values in Figure 9.3 rising from 0.31 to 0.59. The analysis for proximity to multiple emission sources shown, in Figure 9.4, displays a similar relationship with deprivation, with the CI values again increasing as the number of multiple emission sources rises.

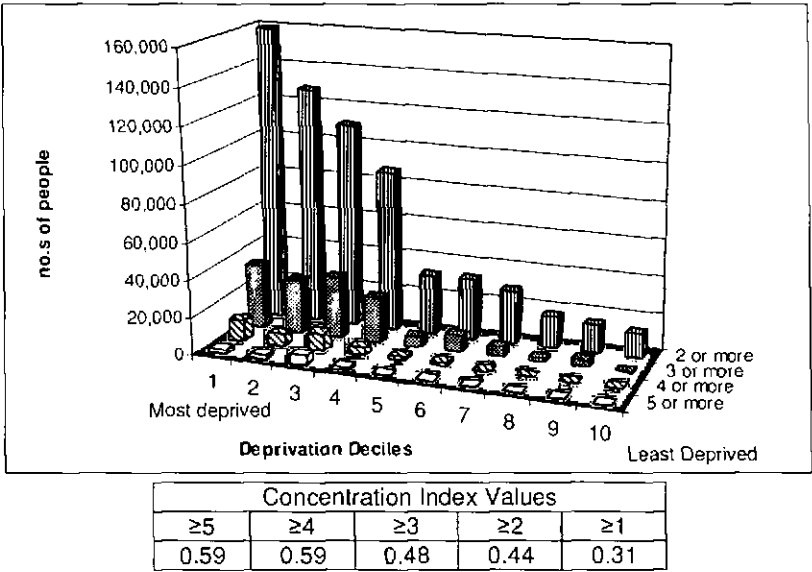


Figure 9.3: Numbers of people living within 1km of multiple (x or more) IPC sites by population weighted deprivation deciles for England

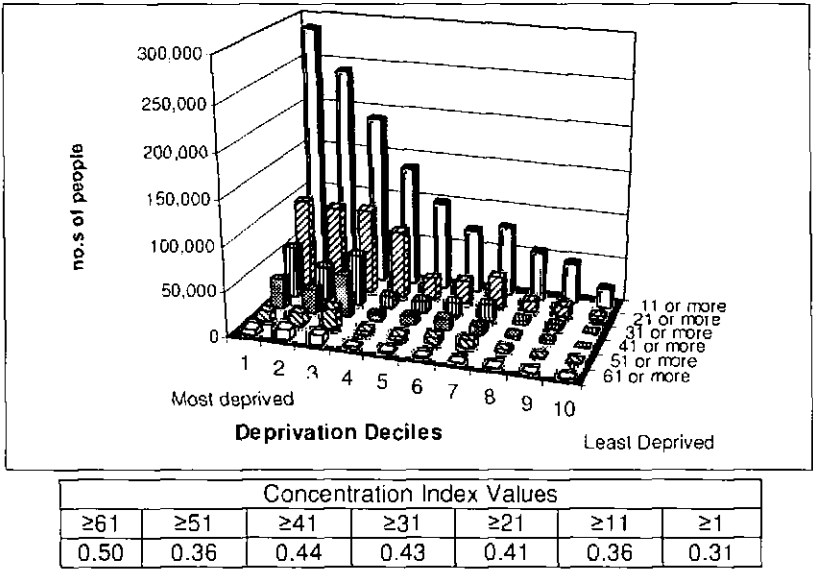


Figure 9.4: Numbers of people living within 1km of multiple (x or more) IPC emission sources by population weighted ward deprivation deciles for England

Within the IPC regime and the pollution inventory database, sites are categorised into one of six industry sectors – chemical, fuel and power, metal, mineral, waste and other. Analysis of site in ward counts for each of the sectors shows that apart from minerals there is a broad gradient indicating a higher number of sites in the more deprived ward deciles. The mineral sector shows a weak inverse pattern so that more of the sites are in the less deprived deciles 6, 7, and 8.

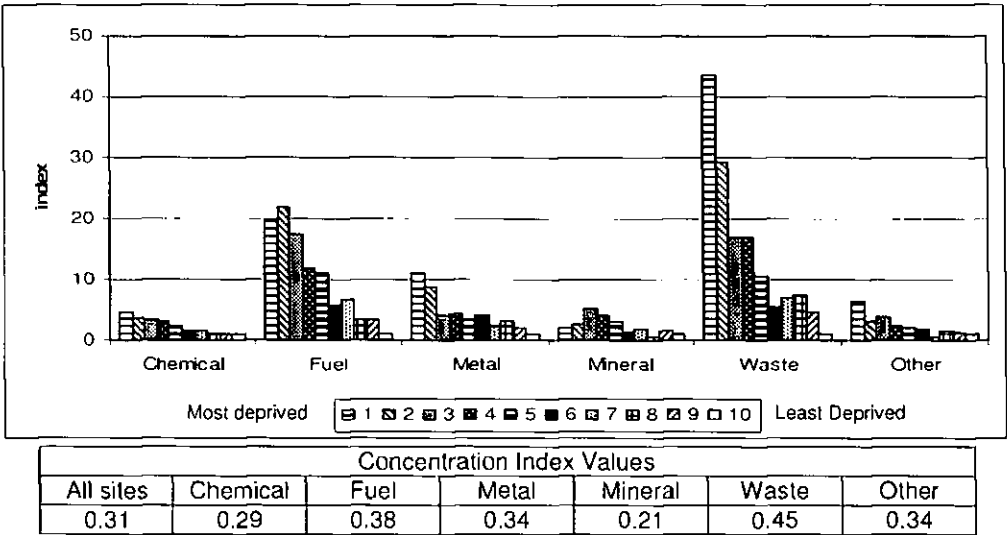


Figure 9.5: Index of ratio between least deprived and other ward deciles for proportion of population within 1km of IPC sites in different industry sectors (index = 1 for decile 10, apart from minerals where 1 = decile 9)

For the 1km buffer population proximity analysis Figure 9.5 charts an index ratio based upon the lowest decile in each sector (which is given a value of 1). All of the sectors, including minerals, show an inequality bias towards the more deprived deciles with the differential in the waste sector standing out as particularly extreme (CI value of 0.45). The proportion of the population in the most deprived decile living within 1km of an IPC waste site is 43 times higher (113,768 people) than in the least deprived decile (2,619 people).

In order to differentiate IPC sites in terms of the level of pollution hazard, the Pollution Hazard Appraisal (PHA) scores assigned to each authorisation by Agency inspectors were utilised. These scores provide a multidimensional indicator of the level of pollution hazard from each authorised process taking account of the nature and amount of substances released and the pollution control technology in place. Band A indicates that the authorisation has a low pollution hazard, band E a high pollution hazard. The majority of authorisations fall into PHA band C with very few in the lowest hazard band A, and none at all in the highest band E.

Higher hazard band C and D authorisations are more prevalent in the more deprived deciles in absolute *and* relative terms (Figure 6.6), whilst band A and B authorisations are more evenly distributed. There are 55 sites with the highest pollution hazard rating in the most deprived 20% of wards, compared to only 4 in

the 20% least deprived. The graduation in CI values - from 0.07 for Band A to 0.4 for Band D - also demonstrates the more equal distribution of low hazard sites and the bias towards more deprived deciles for high hazard sites. There are therefore more fPC sites and more high hazard IPC sites in deprived compared to more affluent wards.

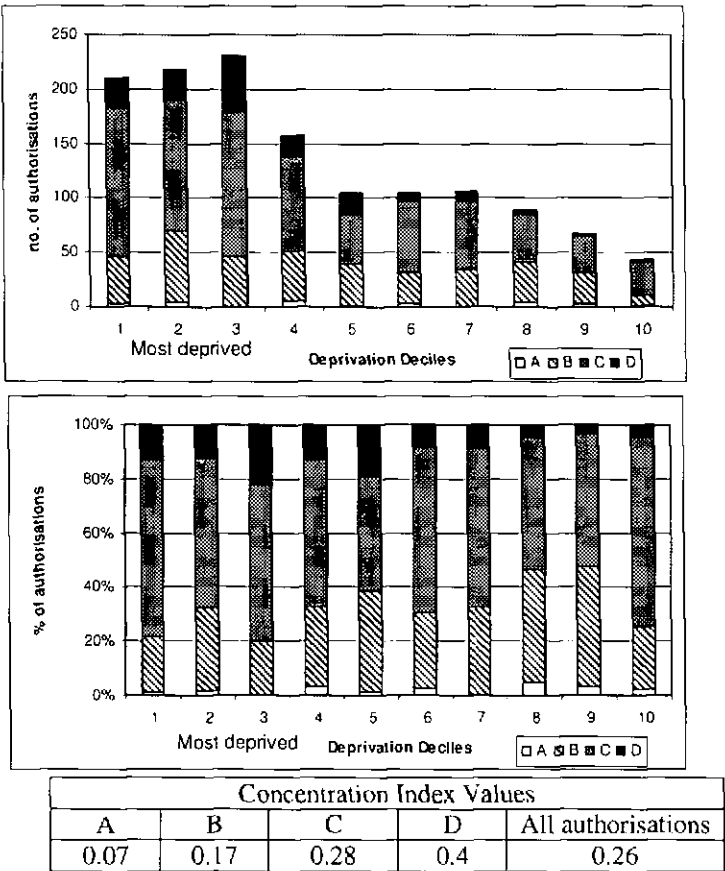


Figure 9.6: Pollution Hazard Appraisal (PHA) scores of authorisations located in population weighted deprivation deciles (A = low pollution hazard, D = high)

One element of the PHA rating which is particularly relevant to the day to day experience of living near to an IPC site is the score given to 'offensive characteristics' that are likely to give 'local annoyance'. In absolute terms there is again a far higher number of authorisations with offensive characteristics in the high deprivation bands than in the lower ones. For the two worst scores on the offensiveness rating (4 and 5) there are 52 authorisations in wards in the most deprived decile, compared to only 9 in the least deprived decile. In relative terms there is also a bias towards the more deprived deciles – the CI value for authorisations with a score of 5 is 0.34 indicating a stronger inequality than the value of 0.26 for all authorisations.

An indicator of operator performance, or how well a site is being run, is provided by the Operator Performance Appraisal (OPA) score within the OPRA

framework. Examining the spatial pattern of operator performance provides an indicator of whether or not the quality of operator performances is potentially related to the social characteristics of the nearby population – one hypothesis might be that sites in ‘better off’ areas are subject to more articulate and politically powerful lobbying than in more deprived areas and that they may consequently make a greater effort to keep up pollution control standards and avoid pollution incidents. Looking at the best run sites falling into band A, there is a higher than average proportion of well run sites in the most deprived decile but *also* in the *least* deprived decile. For the worst run sites in Bands D and E there is little proportional variation between the deciles.

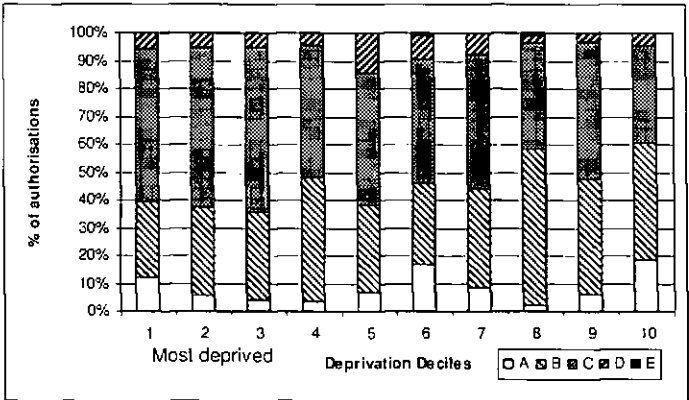


Figure 9.7: Percentage Operator Performance Appraisal (OPA) Bandings for IPC Authorisations within population weighted ward deprivation deciles (A = good performance, E = poor)

One way to begin to explain the cause of unequal social distributions of IPC sites is to examine any differences in the dates at which authorisations are granted. Dividing the authorisations into two time periods found few differences between authorisations approved during 1991-1996 and 1997-2001. The first period has by far the greater number of authorisations as it encompasses the years during which the IPC regulations were first introduced.

The final part of the analysis was to differentiate the emissions into different media, and to examine patterns for specific substances (nitrogen dioxide, particulate matter and carcinogens). By examining patterns of emission to air, which present a more direct health impact than emissions to water or to solid waste streams, we were able to conclude that the relationship with deprivation is broadly the same for all IPC sites and for those making emissions to air across all of the variables examined. A selection of CI values is shown in Table 9.1 to demonstrate this general parity.

Table 9.1: Comparison of Concentration Index Values for All Sites and Sites with at least One Emission to Air

	Sites	Authorisations	Emissions	1km buffer	≥2 sites within 1km	PHA Band D
All Sites	0.22	0.25	0.26	0.31	0.44	0.4

Sites with emissions to air	0.23	0.26	0.25	0.32	0.41	0.4
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Two significant air pollutants that feature within the National Air Quality Strategy and a group of substances with potential carcinogenic impacts on humans were investigated both in terms of the locations of emission sources and the total amounts released to air. Results are presented here as quintiles rather than deciles to smooth the data and better represent relationships. Emissions of nitrogen dioxide (Figure 9.8) show a peak in the third quintile due to the influence of a few very large emission sources (this quintile has 18% of emission sources by number but 45% of total emissions by weight) and this balances with the substantial emissions in the lowest quintile to produce a low CI score.

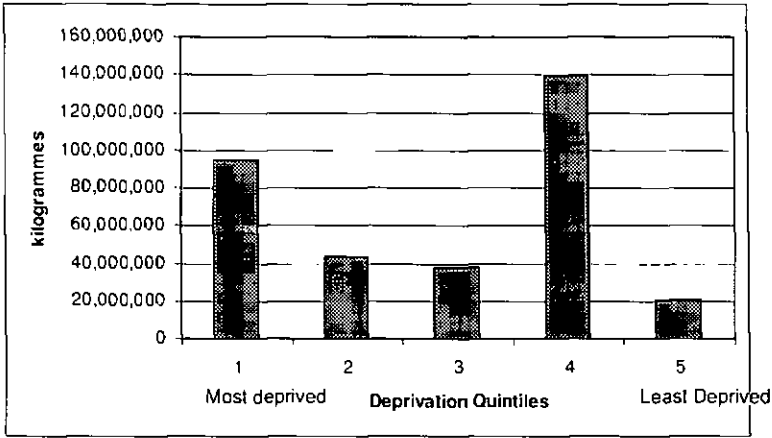


Figure 9.8: Total Emissinnns of NO₂ from IPC sites in England by population weighted ward deprivation quintile (CI = 0.07).

Emissions of particulates (PM₁₀) show a strong relationship with deprivation (Figure 9.9). The highest absolute and percentage emissions are in lowest quintile. The most deprived 20% of wards are the location for 42% of all PM₁₀ emissions from IPC sites in England, whilst the least deprived 20% of wards are the location for less than 0.5%. That there are substantial emissions in the more deprived wards is relevant to the air quality ‘pollution-poverty’ hot spot analysis discussed in section 10.6.

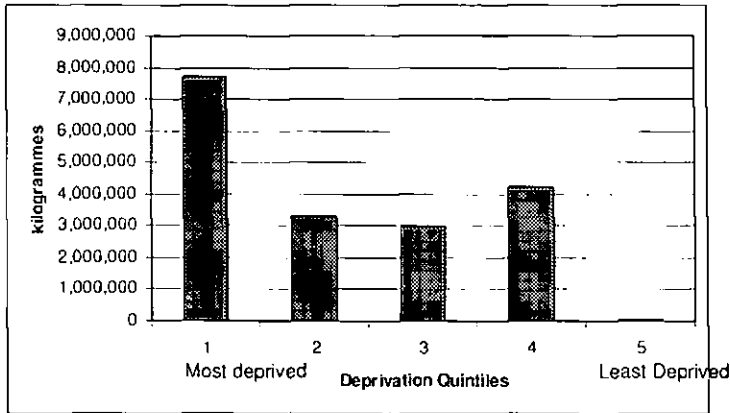


Figure 9.9: Total Emissions of PM₁₀ from IPC sites in England by population weighted ward deprivation quintile (CI = 0.28).

Carcinogenic emissions cover 35 substances released to air from at least one site in 2001. We utilised a definition of carcinogenic (and mutagenic) substances provided to the Agency by the Department of Health and analysed both the distribution of site locations and the total quantities released⁵³. This analysis reveals a strong relationship with deprivation (Figure 9.10). The most deprived 20% of wards is the location for 55% of total aggregated emissions, compared to 9% in the least deprived. These results are not as acute as those produced by Friends of the Earth (2001) which found 66% of emissions in the most deprived 10% of wards. The difference in results may be due to a number of factors – a different definition of carcinogenic substances, different year of data and our use of population weighted ward deciles.

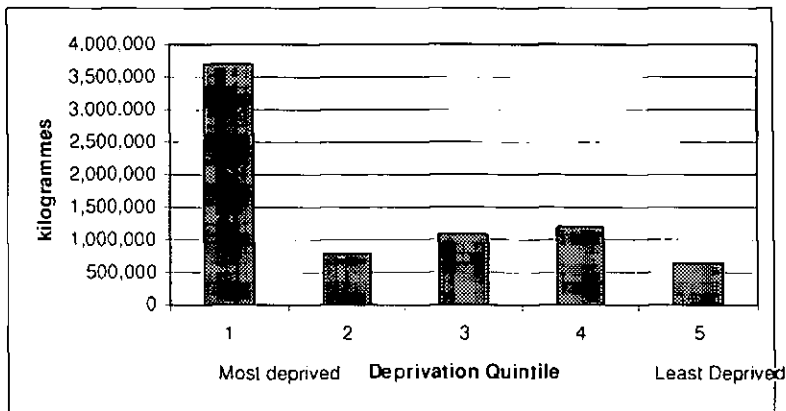


Figure 9.10: Total Emissions of Carcinogenic Substances to air from IPC sites in England by population weighted deprivation quintile (CI = 0.28).

⁵³ Aggregating the quantities released provides only a crude indicator as different substances will have different carcinogenic properties.

9.3 IPC Sites and Deprivation in Wales

In Wales there are approximately a tenth of the number of IPC sites in England. The 'site in ward' counts for sites, authorisations and emissions show no clear relationship with deprivation with the highest numbers in the 4th and 7th deciles and the lowest numbers in the most deprived decile (Figure 9.11). The CI values indicate a very marginal bias towards the *less* deprived deciles which is slightly stronger for emissions.

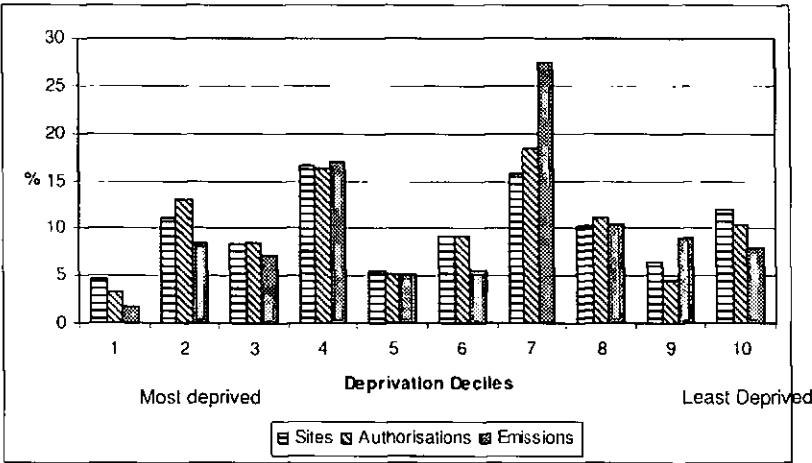
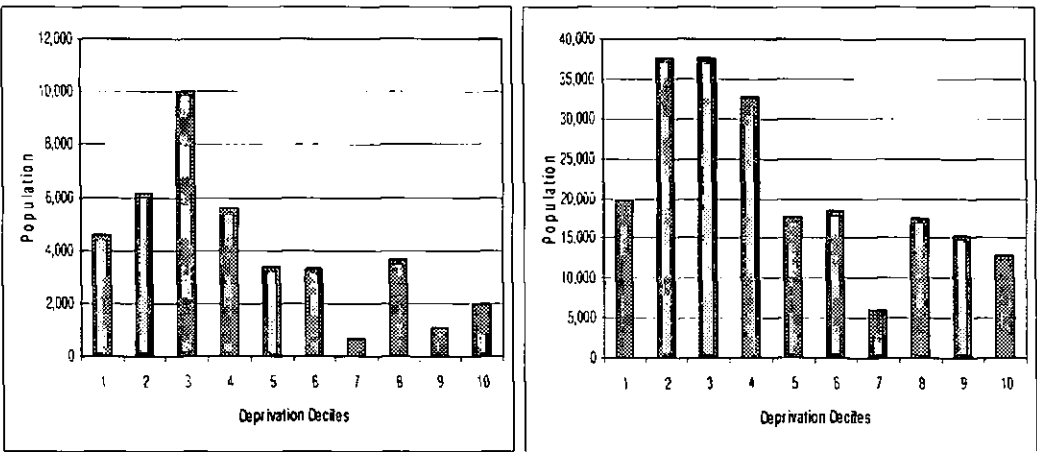


Figure 9.11: Percentage of Sites, Authorisations and Emissions by population weighted ward deprivation decile for Wales (using 'site in ward' counting method)
CI values = -0.04 (sites) -0.03 (authorisations) -0.11 (emissions).

Using the population proximity method a different pattern emerges with contrasting evidence of a disparity towards the *more* deprived deciles. The profiles shown in Figure 9.12 and the CI values of 0.26 and 0.18 indicate an overall bias towards the lower deciles - but to a lesser degree than for England which had equivalent CI values of 0.31. The inequality is also less skewed in Wales towards the most deprived decile 1. This disparity between the methods suggest that the population proximity data is picking out populations near to IPC sites, but not located within the same wards as the sites.



500m buffer

1km buffer

Figure 9.12: Total populations living within 500m and 1km of an IPC site by population weighted ward deprivation deciles for Wales. CI values = 0.26 and 0.18.

The numbers of people living in proximity to multiple sites and the concentration of multiple sites in Wales is much lower than in England (Figure 9.13). There is also little evidence of multiple sites being disproportionately located in the more deprived deciles - indeed the CI values show a bias towards the *less* deprived deciles as proximity to multiple sites increases.

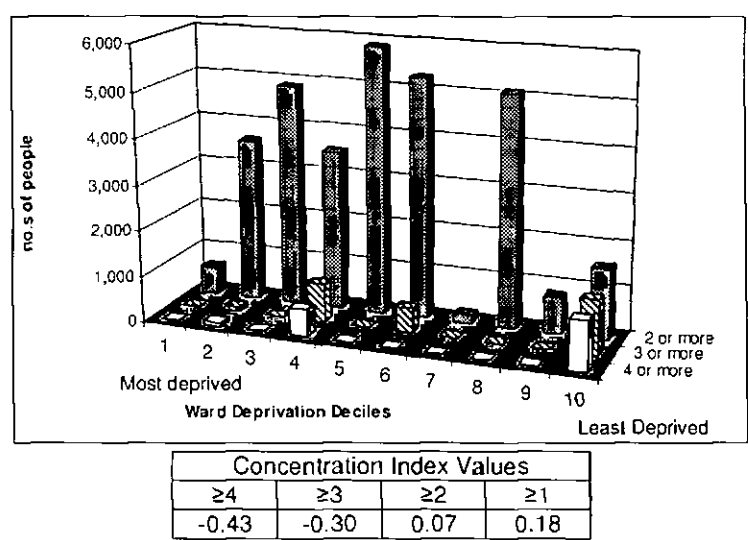


Figure 9.13: Numbers of people living within 1km of multiple (x or more) IPC sites by population weighted deprivation deciles for Wales

The analysis of data by industry sector for Wales is hampered by the low total number of sites in some sectors. For the waste sector there are only two sites, minerals eight and metals 13. For the two sectors where there are a greater number of sites (chemicals and fuel) there is no evident relationship with deprivation through counting site locations in wards. However, the 1km buffer population proximity analysis again reveals more distinct patterns (Figure 9.14). There are biases towards deprived deciles for chemical, fuel and metal sectors, and towards less deprived for mineral, waste and other industries. For the two waste sites the entire population within 1 km is to be found in the more affluent deciles 8 and 9.

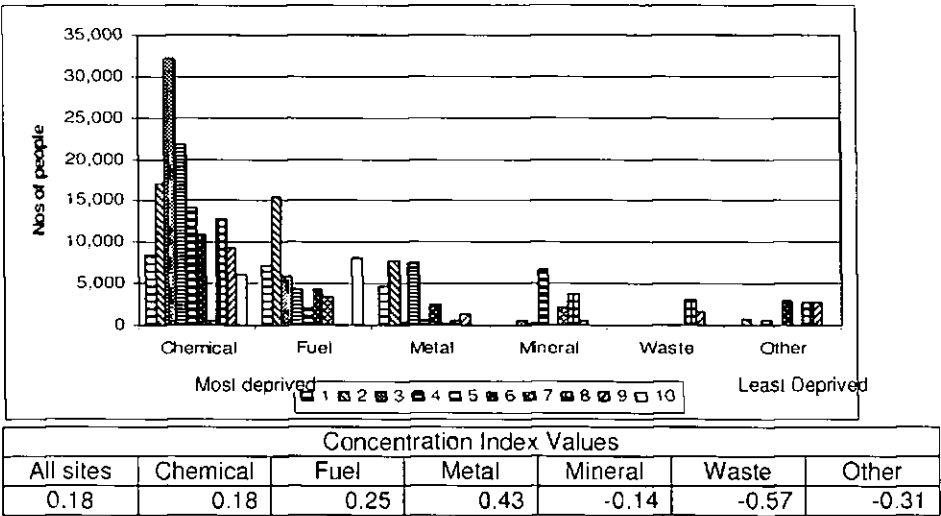


Figure 9.14: Numbers of people living within 1km of IPC sites by industrial sector for Wales

Using the PHA scores to differentiate IPC sites in terms of the level of pollution hazard they present, produces no evident pattern with deprivation (Figure 9.15). The highest hazard sites in band E occur in deciles 4, 8 and 9 and the CI values are all close to zero.

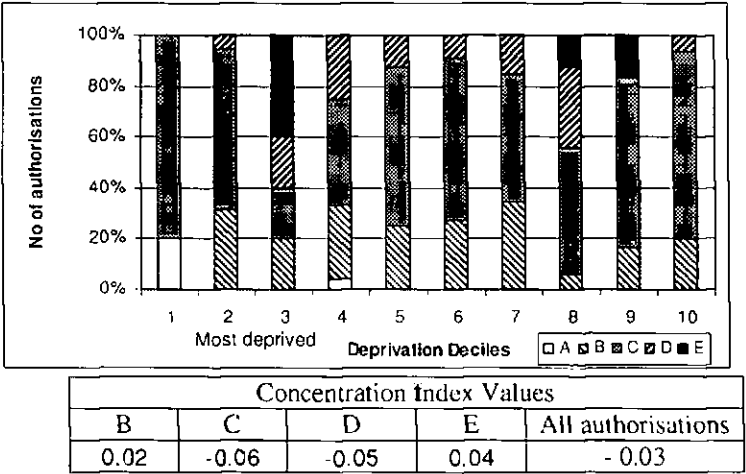


Figure 9.15: Pollution Hazard Appraisal (PHA) scores of authorisations in Wales by deprivation deciles (A = low pollution hazard, E = high)

The score given to 'offensive characteristics' also showed an indistinct pattern but focusing on authorisations with the highest score of 5 there are marginally greater proportions of these towards the *less* deprived deciles, but the trend is not strong.

Using the Operator Performance scores it is again hard to pick out any pattern (Figure 9.16). All of the best run sites in category A are in decile 4. The worst

run sites in band D (there are none in band E in Wales) are distributed across the mid range of deciles rather than at either extreme. This data therefore provides no evidence of a clear relationship between operator performance and deprivation. Examining patterns by date of authorisation shows that there has certainly been no particular bias towards the lower deprivation deciles with the highest % of new authorisations in deciles 4 and 7 and no new authorisations at all in decile 1.

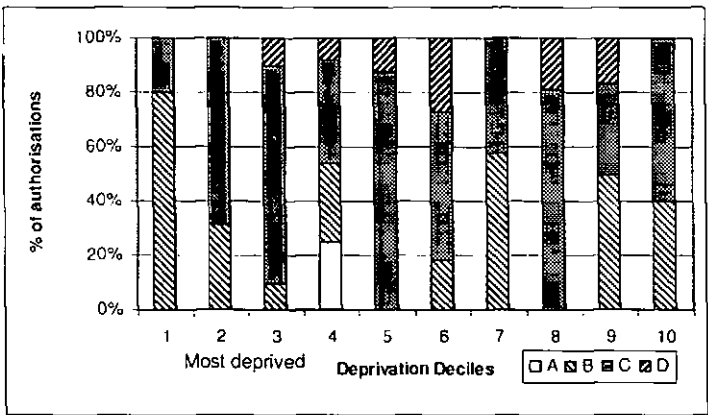


Figure 9.16: Percentage Operator Performance Appraisal (OPA) Bandings for IPC Authorisations within deprivation deciles (A = good performance, E = poor)

The analysis of emissions of specific substances shows in each case an inverse relationship with deprivation (Figures 9.17–9.19). For NO₂, PM₁₀ and carcinogens the CI values are all negative, with the strongest relationship for NO₂. These patterns contrast with England in showing higher emission levels in less rather than more deprived areas.

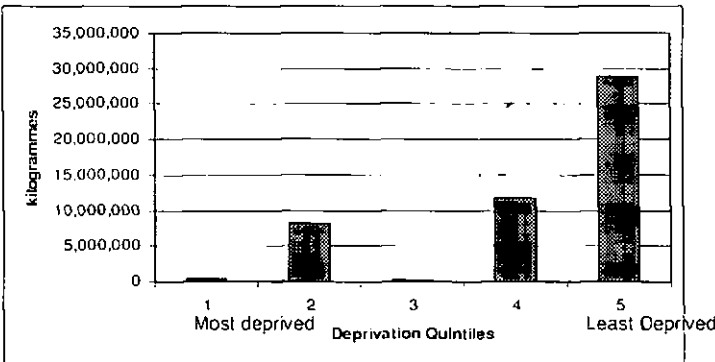


Figure 9.17: Total Emissions of NO₂ from IPC sites in Wales by population weighted ward deprivation quintile (CI = -0.43).

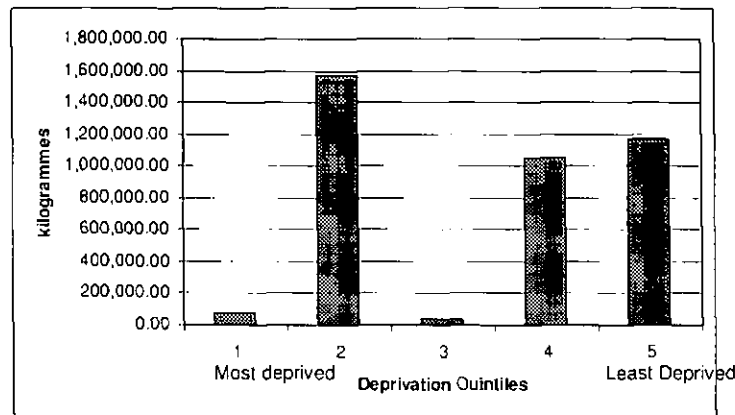


Figure 9.18: Tntal Emissions of PM₁₀ from IPC sites in Wales by population weighted ward deprivation quintile (CI = -0.16).

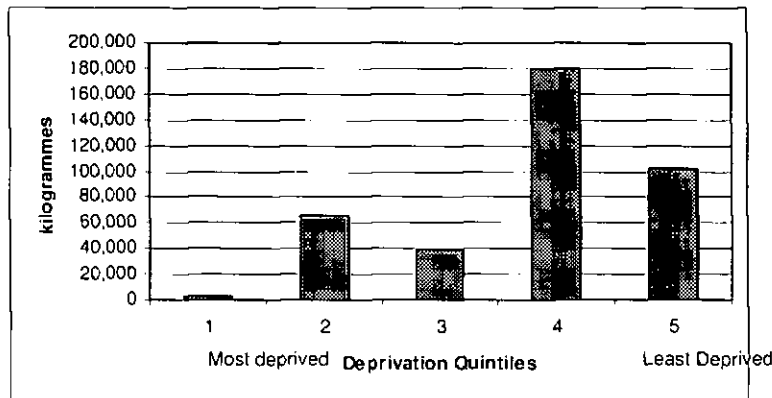


Figure 9.19: Total Emissions of Carcinogenic Substances to air from IPC sites in Wales by population weighted deprivation quintile (CI = -0.27).

9.4 Discussion

There is compelling evidence of a socially unequal distribution of IPC sites in England. These significant sources of pollution are disproportionately located in more deprived areas. IPC sites are also more clustered together in deprived areas, on average produce greater numbers of emissions and present a greater potential pollution hazard in deprived areas. They also produce more ‘offensive’ pollutants which are likely to have an impact on the day-to-day quality of life. Through simple mapping though many tight clusters of sites in deprived industrial-urban areas can be identified – including the North West in the area running from Liverpool through to Manchester, Leeds and Bradford, Sheffield, Birmingham, Teesside, Tyneside and in London running out along the Thames estuary. The fact that waste sites in particular stand out as being disproportionately located in more deprived areas raises particular issues for waste policy regarding the social distribution of local impacts from incinerators at a time when a substantial programme of new construction is planned.

In contrast to England the patterns of distribution of IPC sites in Wales shows a less distinct relationship to deprivation. The locations of sites in wards analysis shows no association with deprivation, although the population within 1km of an IPC site does exhibit some bias towards more deprived deciles (but not the *most* deprived) – suggesting that the distribution of sites and populations in Wales is particularly sensitive to the method of spatial analysis utilised. There is no evidence of a greater concentration of emission sources or of processes producing a greater pollution hazard in more deprived areas. Indeed the data for proximity to multiple sites and for levels of emissions of specific substances show a bias towards the less deprived, more affluent deciles. An explanation for the social pattern of site locations in Wales and the differences between England and Wales appears to rest in part with the geography of deprivation in Wales. The most deprived wards particularly in the South Wales valleys have few IPC sites – due to the particular industrial history of these areas.

9.5 Inequality, Inequity and Causality

Whilst there is strong evidence that in England there is a distributional inequality in the location of IPC sites, the extent to which this is seen as inequitable and unfair and in need of redress is a question of judgement. There are a number of dimensions to this judgement, that will be evaluated in different ways by different stakeholders. These dimensions include:

- the extent to which population proximity to sites and emission sources can be reasonably assumed to produce undesirable impacts of various forms. Proximity can only be a surrogate for exposure to hazard, risk or disamenity, which is an important limitation of site based equity analyses;
- the extent to which the spatial and social distribution of the benefits gained from IPC sites, such as employment, can be seen to balance with or compensate for the negative dimensions of proximity (although a pattern of significant employment in the immediate community around an industrial site cannot nowadays be presumed);
- the extent to which 'informed choice' is considered to have been exercised by people living in areas near to IPC sites (remembering that the degree of choice in residential location is not equal across social groups);
- whether there are particular decision-making processes operated by public or private bodies that make sites in deprived areas more potentially or actually hazardous (such as greater management or regulatory attention being given to sites in more wealthy and politically articulate communities);
- whether there are particular discriminatory decision-making processes operated by public or private bodies which have created or are reinforcing the unequal distribution of IPC sites.

In our analysis we have only been able to begin to touch on some of these questions through the examination of national data sets. In particular, issues of causality - why the association between deprivation and site location exists - are

very difficult to address through a national level statistical analysis and may need to be explored through alternative and more locally focused research methods. However, we have been able to establish that:

- for emissions to air, which are more directly linked to health impacts, the social distribution of site locations is largely the same as for all IPC sites.
- there no evidence from the scores given by the Agency for operator performance that sites are being worse run in deprived areas and therefore are potentially presenting a greater hazard due to poor site management.
- there is no evidence from our analysis that the Agency's site inspection priorities discriminate against deprived areas. As inspection priorities are guided by OPRA scores the higher pollution hazard ratings in deprived areas should rather focus attention on sites in more deprived areas. This is, however, only a limited indicator of inspection practices on the ground.
- there is no evidence that authorisations applied for and granted more recently are disproportionately biased towards more deprived areas. Whilst this provides some rebuttal of the hypothesis that companies have become more sensitive to NIMBY reactions and could therefore be deliberately targeting less organised and mobilised communities in new site investments, it also shows that patterns of new authorisations are not becoming more equitable than they have been in the past. In other words past patterns are being maintained.

One line of argument emerging from the considerations outlined above could be that whilst there is an inequality in location and population proximity, there is either too little known about the resulting impacts, in particular on health, or the causes of this inequality, to warrant policy action. If, however, we accept that the many dimensions of the unequal distribution of IPC sites we have found (in England at least) *can* reasonably lead us to a conclusion that this situation is unfair and needs to be addressed in some way, what potential responses exist? The range of possibilities to be considered are numerous, but include:

- *directing new IPC sites away from deprived areas.* Whilst not addressing the situation that currently exists, such a policy would ensure that the inequality of distribution did not worsen further. Such a response could in theory be achieved through land use planning policy but would go against typical current planning presumptions that polluting industry (or other undesirable activities) should be clustered together in areas of poor environmental quality rather than 'spread around'. Many further questions are raised by this form of response. By what criteria could such a policy be applied; is greater distributional equity being sought at a national, regional or local scale; what if deprived communities want to attract new industry to create jobs; is it politically realistic to direct say new incinerators into leafy suburbs?
- *applying higher standards in deprived areas in particular with multiple sites/emissions* The only way of addressing the current unequal situation (unless wholesale site relocation is to be advocated) is to take measures that

disproportionately seek to reduce the impacts from IPC sites in deprived areas. A targeted approach could for example particularly focus on areas where there are multiple sites and multiple hazardous/offensive emissions and deprived populations. However, a number of difficult questions also need to be addressed here. How much of a concentration of sites or emissions or perhaps 'degree of cumulative risk' warrants a particular claim of injustice? How should the impacts of 'applying higher standards' be measured - through reductions in numbers of emissions, levels of emissions, improvement in environmental management standards?

- *providing information on deprivation within decision-making processes.* Rather than laying down a general siting policy as under the first option, an alternative is to seek decision-making that is informed about deprivation implications. Information on deprivation (and other social characteristics of affected populations) is not routinely produced within, for example, project or strategic Environmental Assessments but could be seen as a relevant addition to sit alongside other information produced for planning and policy decisions. Sharing such information with the local community could be seen as a particularly important dimension of local engagement.
- *developing compensatory benefits for deprived communities.* The concept of compensation derives from an economic view of the need to balance the unequal distribution of cost and benefit and has been proposed particularly as a solution to problematic siting processes for 'locally unwanted land uses'. If particular communities are taking the burden of costs for the wider societal good, then they maybe should receive compensatory benefits which in some form match the costs borne. Arguments for compensation may be particularly strong where deprived communities are taking the burden of costs, whilst benefits are gained more by the wealthy. Compensation can take a range of monetary or non-monetary forms, including, for example, greater investment in public services such as health and education and improvements in general environmental quality.
- *strengthening general emission and operator performance standards.* If IPC sites are disproportionately located in deprived areas it can be argued that across the board action to reduce emissions and improve operator performance will therefore help the poor more than others. An additional social justice argument is thus added to the case for investment of resources into environmental regulation and management more generally.

Recommendations

1. The Agency should consider whether or not a targeting of regulatory attention on IPC sites in more deprived areas is warranted by the overall pattern of association between deprivation and site location in England. This could be implemented in a number of ways such as an adjustment to OPRA scores, which are used to prioritise a number of Agency actions, to reflect deprivation data.

2. Whilst the Agency does not have decision-making powers over land use planning decisions it should consider entering into dialogue with the ODPM and local planning authorities over possible planning and siting responses to the inequity of IPC site location (as discussed above).
3. The fact that IPC sites are agglomerating particularly in deprived areas raises the question of whether sufficient significance is being given to the accumulation and concentration of multiple emissions in such areas. We therefore recommend that the Agency considers whether the evidence of social inequality in site distribution should stimulate further attention to be given to assessing the risks of cumulative and synergistic exposure to emissions from IPC sites.
4. Our analysis of air quality data has identified particular 'poverty-pollution' hot spots. One of the contributory sources to pollution in these areas could be emissions from IPC sites, providing a direct way in which the Agency can work with local authorities and others to address local air quality problems. We therefore recommend that the Agency undertakes further work to examine the relationship between poor air quality and IPC emissions in these 'hot spot' areas.
5. The generation of information on the social characteristics of communities living near to polluting sites has been one of the key responses made by the EPA in the US to the commitment to build environmental justice concerns into its policy and operating practices. That information is then used in a number of ways to inform decision making and work with local communities. We recommend that the Agency considers similar action by developing techniques for social equity appraisal for IPC sites that can be used within the Agency and by other key partners such as local planning authorities.
6. Whilst our research has provided a more detailed and wide ranging analysis of the social equity dimensions of IPC site locations, emissions, hazards and operator performance than previously available, there are still inevitably unanswered questions and ways in which the analysis could be extended. Areas for further specific IPC related research include:
 - undertaking analysis in relation to other social variables (such as age, ethnicity, health);
 - more intensive regional or local analysis (perhaps focused on agglomerations of polluting sites);
 - analysis of processes of causation through more detailed longitudinal case studies of the sequencing of locational decisions (between sites and nearby development) and changes in the social make-up of local communities;

- analysis of the distribution of a wider range of emitted substances and groups of substances; detailed investigation of patterns of site inspection and other aspects of Agency intervention;
- use of improved spatial information such as site boundaries within analysis and the finer grained social information available from the 2001 census;
- analysis of pollution incident data including the pattern of incidents at IPC sites.

10 AIR QUALITY AND DEPRIVATION

10.1 Introduction

Air quality has been subject to more UK equity research than any other environmental issue to date. However, the studies are very diverse in nature, addressing different pollutants, spatial scales, spatial units, social characteristics and analytical methods. This diversity, in what is collectively a small body of research, has prevented broad conclusions on the relationship between air quality and deprivation from being drawn.

We report here on further research on the relationship between air quality and deprivation. In addressing all of England and Wales at ward level, our intention was to overcome problems associated with earlier studies that addressed individual cities, or which operated at the local authority district scale, and which consequently drew very conflicting conclusions. We build upon the only previous ward scale national analyses (Environment Agency 2002, Mitchell and Dorling 2003) by addressing the following objectives, agreed at the April workshop:

- Address poverty using the Index of Multiple Deprivation (IMD 2000) (DETR 2000a);
- Extend the analysis to cover Wales, as well as England;
- Increase the range of atmospheric pollutants previously studied;
- Attempt equity analysis that addresses multiple pollutants collectively; and
- Investigate how environmental equity patterns vary over time.

10.2 Data and methods

The study addressed five National Air Quality Strategy (NAQS) (DETR, 2000b) pollutants for which small area national concentration data were available: nitrogen dioxide (NO₂), fine particulates (PM₁₀), sulphur dioxide (SO₂), carbon monoxide (CO), and benzene. The data are annual mean concentrations for each 1 km² grid cell centroid in the UK, for 2001 and 2010 (NO₂ and PM₁₀). Concentrations are forecast at the National Environmental Technology Centre, using inputs from the national emission inventory, box-modelling, and calibration against a network of air quality monitoring stations (Stedman *et al.* 2001a, 2001b). The data are widely used in local authority NAQS air quality management strategies.

Using a GIS, for each pollutant we calculated ward mean concentrations, values that formed the basis of our analysis. In principle, codepoint data can be used, in a similar manner to that of the IPC analyses, to provide a more refined analysis that does not rely on ward mean concentration values. However, a national analysis of air quality using codepoint data is computationally highly intensive, hence given the resource limitations of this scoping study, we chose to analyse the social distribution of ward mean concentrations.

We also developed a simple air quality index so as to collectively address multiple pollutants. The index related modelled concentrations to NAQS standards, in an additive, non-weighted manner, which we felt best reflected current knowledge on the combined health effects of multiple pollutants (DoH, 1998). The index has the form:

$$AQI_j = \sum_i^4 (C_{ij} / S_{ij})$$

Where: AQI_j is the air quality index for ward j
 C_{ij} is the concentration of pollutant i in ward j
 S_{ij} is the standard or guideline value for pollutant i

Annual mean NAQS standards exist for PM_{10} , NO_2 and benzene but not for SO_2 or CO. We therefore used the WHO guideline value for annual mean SO_2 , which is $50 \mu g/m^3$ (WHO, 2000). All CO standards are based on short averaging times, hence CO was not included. The index is most sensitive to NO_2 and PM_{10} , which generally have higher concentrations that are closer to permitted standards than is the case for benzene or SO_2 . The index is unitless, with values ranging from, in theory, zero to infinity, but in practice values are unlikely to exceed 4, the equivalent of a site where concentrations of all four pollutants are at their respective standards.

For individual pollutants, and the air quality index, we examined the social distribution (pollutant distribution by deprivation) of: (a) ward annual mean air quality; (b) ward mean exceedences of NAQS standards; and (c) the distribution of wards with the poorest air quality, irrespective of standards.

10.3 Air quality and deprivation in England

For all pollutants studied, we find considerable variability of pollutant concentration within each deprivation decile, but overall, the most deprived wards are clearly also those with highest pollutant concentrations. The social distribution of nitrogen dioxide (Figure 10.1) is typical, showing that people in deprived wards are exposed to NO_2 concentrations higher (by 41%) than those of wards of average deprivation. This finding is consistent across all pollutants studied, with 2001 ward mean concentrations in the most deprived decile that, depending on pollutant, are 11-76 % greater than those of the mid deciles (Table 10.1).

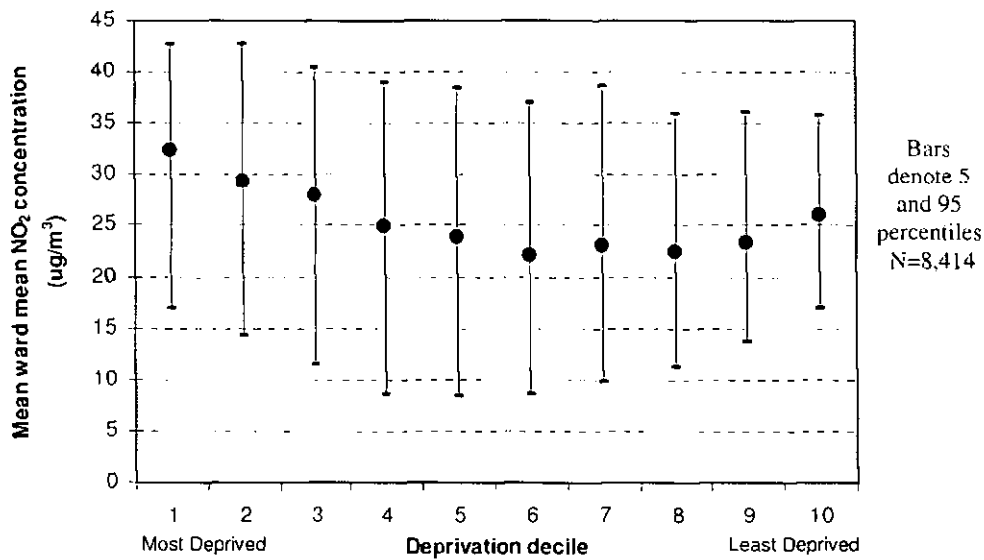


Figure 10.1 Social distribution of nitrogen dioxide (NO₂) in England, 2001

Note, however, that no simple linear relationship between ward mean concentration and deprivation exists. For all pollutants (except SO₂), the least deprived also experience concentrations that are above those for people of average deprivation, although the elevation above the average is much less than that of the most deprived, no more than 13 % (Table 10.1). The consistency of this curvilinear pollution-deprivation relationship is illustrated by Figure 10.2, that shows the social distribution of the air quality index.

Table 10.1 Social distribution of air quality, standardised to mean deprivation

Air quality parameter	Year	Air quality standardised against mean deprivation		
		Most deprived (decile 1)	Mean deprivation (deciles 5 & 6)	Least deprived (decile 10)
Nitrogen dioxide	2001	141*	100	113
	2010	146	100	112
Particulates PM ₁₀	2001	111	100	104
	2010	110	100	103
Sulphur dioxide	2001	127	100	97
Carbon monoxide	2001	138	100	108
Benzene	2001	176	100	109
Air Quality Index	2001	130	100	109

* i.e. concentration is 41 % above that experienced by mean deprivation wards

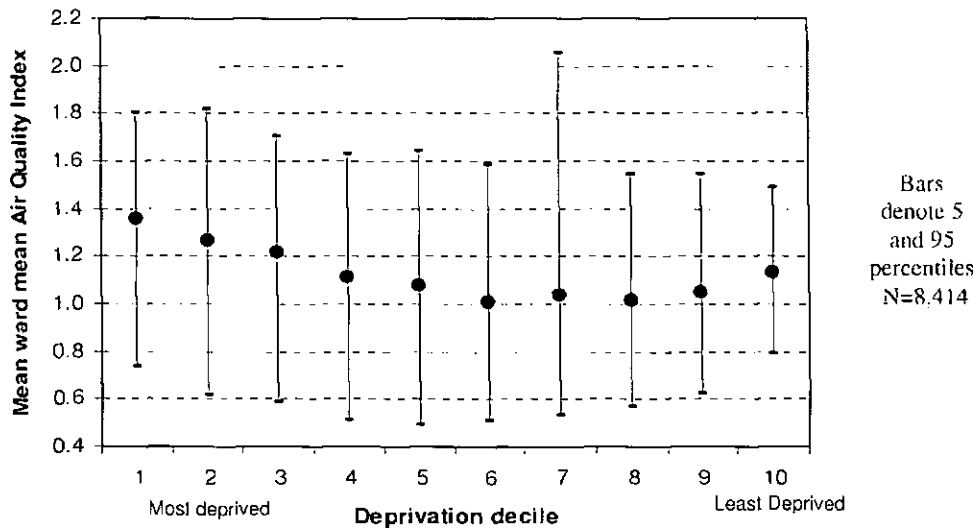


Figure 10.2 Social distribution of the Air Quality Index in England, 2001

Examining those wards with the highest pollutant concentrations, we find that the distribution is no longer curvilinear, but that the number of people resident in wards above high pollution thresholds increases progressively with increasing deprivation. For example, of the 2.5 million people in England resident in wards with a mean NO₂ concentration above the NAQS standard (40 ug/m³ as an annual mean), we find that over half are in the most deprived quintile, and just 1 % in the least deprived decile.

If we examine the deprivation characteristics of populations exposed to the highest ward concentrations (most are within NAQS standards) we find this pattern occurs for all pollutants. For example, of the 10 % of the population resident in wards with poorest air quality, we typically find that half reside in wards that are amongst the 20 % most deprived in the country (Table 10.2, Figure 10.3). In contrast, typically only 5 % of this 'most exposed' group are in the least deprived 20 % of the population. Thus whilst the poorest air quality is found in the most and least deprived communities, the poor bear the greatest burden (by an order of magnitude more than the least deprived).

Table 10.2 Social distribution of greatest (worst 10%) air quality concentrations

Air quality parameter	Year	% population in deprivation quintile resident in wards with highest pollutant concentration				
		Q1 (Most deprived quintile)	Q2	Q3	Q4	Q5 (Least deprived quintile)
Nitrogen dioxide	2001	47	22	16	10	5
	2010	47	24	14	9	5
Particulates (PM ₁₀)	2001	50	26	10	9	5
	2010	54	24	10	7	4
Sulphur dioxide	2001	33	26	20	12	9

Carbon monoxide	2001	47	26	14	9	5
Benzene	2001	45	27	13	9	6
Air Quality Index	2001	48	23	15	9	4

* i.e. of the 10 % of the national population resident in wards with the poorest air quality, 47 % also live in the most deprived 20 % of wards.

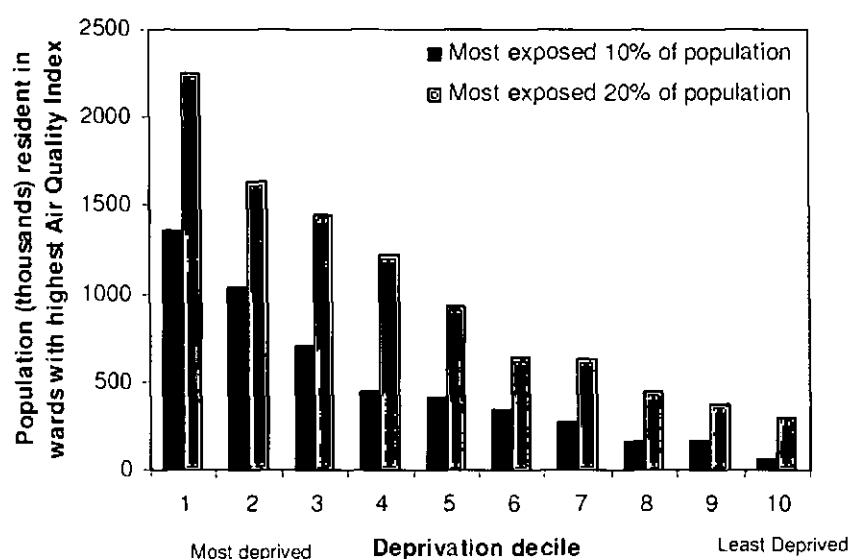


Figure 10.3 Distribution of highest ward mean Air Quality Index (2001)

10.4 Air quality and deprivation in Wales

At first sight, the results for Wales suggest the same relationship between air quality and deprivation as seen for England. Figure 10.4 shows the social distribution of ward mean NO₂, a pattern characteristic of all the pollutants studied. Again, there is a curvilinear relationship, with both the most and least deprived wards experiencing concentrations above those of wards of average deprivation. However, in contrast to England, pollutant concentrations in Wales are highest in the least deprived wards, although the distribution is, overall, more equitable than that observed for England (Table 10.3).

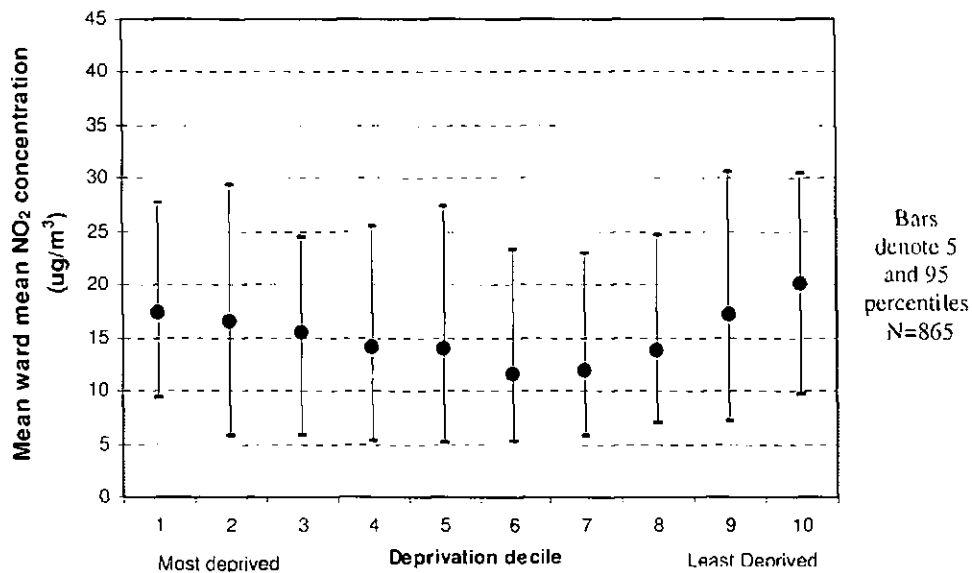


Figure 10.4 Social distribution of nitrogen dioxide in Wales, 2001

Table 10.3 Social distribution of air quality, standardised to average deprivation

Air quality parameter	Year	Air quality standardised against mean deprivation		
		Most deprived (Decile 1)	Mean deprivation (Deciles 5 & 6)	Least deprived (Decile 10)
Nitrogen dioxide	2001	138*	100	158
	2010	139	100	162
Particulates PM ₁₀	2001	110	100	112
	2010	109	100	111
Sulphur dioxide	2001	128	100	123
Carbon monoxide	2001	119	100	130
Benzene	2001	155	100	159
Air Quality Index	2001	125	100	135

* i.e. concentration is 38 % above that experienced by mean deprivation wards

The social distribution of poor air quality in Wales displays greater variability than that of England, in part due to a smaller population. However, the poorest air quality is disproportionately found in the least deprived wards (Figure 10.5). For example, of the 10 % of the Welsh population with the greatest exposure to CO and NO₂, over 40 % are resident in the least deprived 20 % of wards. This is twice that which would occur if this pollution was equally distributed by deprivation. Typically there are three to four times as many 'affluent' people resident in wards with the worst air quality, as there are poor (Table 10.4).

The difference between the Welsh and English patterns arises because the least deprived households in Wales tend to be more urban than their English equivalents, and are mostly located in S E Wales where most of the poorest air quality occurs. It is likely that these affluent households are more urban than

might be expected, as they are geographically constrained to Cardiff by the sea to the south, and by the deprived valleys to the north. Note also that air quality in Wales is generally better than England, and hence poor air quality (and correlates such as noise and congestion) is a weaker deterrent to locating in the city. Cardiff may not be unique in the UK (indeed we see above average pollution in affluent English wards), but it dominates the Welsh situation, and exerts a major influence on the national pattern.

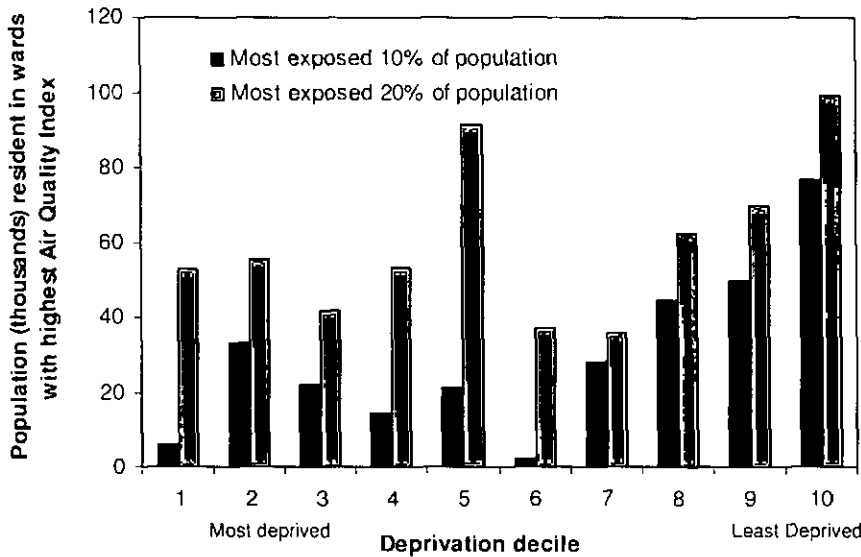


Figure 10.5 Distribution of highest ward mean Air Quality Index in Wales

Table 10.4 Social distribution of greatest (worst 10%) air quality concentrations

Air quality parameter	Year	% population in deprivation quintile resident in wards with highest pollutant concentration				
		Q1 (Most deprived quintile)	Q2	Q3	Q4	Q5 (Least deprived quintile)
Nitrogen dioxide	2001	11	13	11	24	41
	2010	16	11	14	23	36
Particulates (PM ₁₀)	2001	17	11	19	19	34
	2010	18	11	20	21	29
Sulphur dioxide	2001	21	16	25	18	19
Carbon monoxide	2001	11	15	7	23	43
Benzene	2001	13	12	8	24	42
Air Quality Index	2001	14	13	13	24	35

- i.e. of the 10% of the population resident in wards with the poorest air quality, 11 % also live in the most deprived 20 % of wards.

10.5 Longitudinal (temporal) analysis

Our analysis of changing air quality-deprivation patterns (from 2001 to 2010), is to some extent constrained by the availability of good data for 2010, particularly with respect to the representation of spatially dependent emission processes. Nevertheless, our analysis is sufficient to suggest that whilst the total burden of air pollution will continue to fall, there will be relatively little change in the social distribution of that pollution, although the distribution of the poorest air quality should become more equitable.

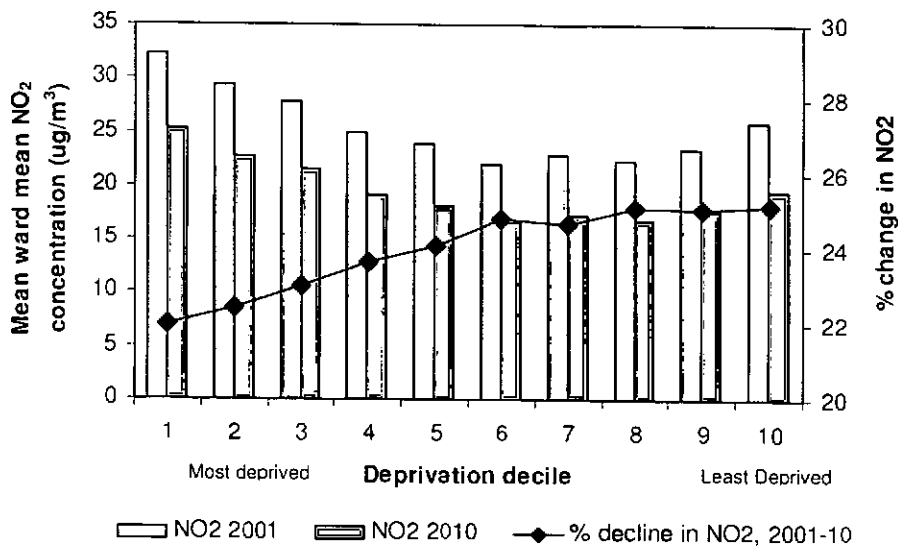


Figure 10.6 Change in social distribution of ward mean NO₂, 2001-2010 (England)

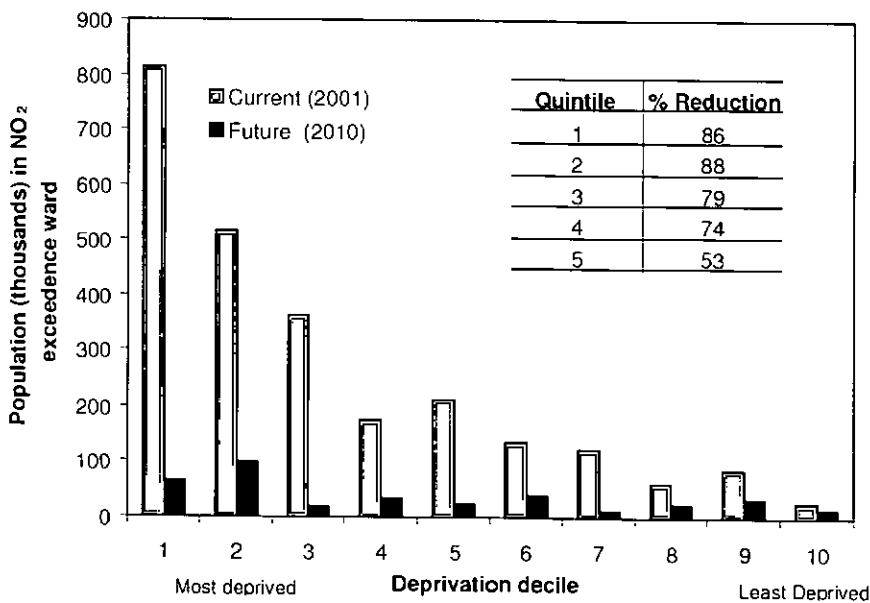


Figure 10.7 Population in an NO₂ exceedence ward, 2001-2010 (England)

In absolute terms the poor will enjoy the greatest benefits of air quality improvement. Figure 10.6, for example, shows that the most deprived decile experiences a reduction in ward mean annual NO₂ of 7.1 ug/m³ from 2001-10, compared to 5.5 ug/m³ for people of average deprivation and 6.5 ug/m³ for the least deprived decile. In relative (% change) terms however, the poor do not enjoy the same improvement in NO₂ as others, although the differences are small (Figure 10.6).

If we examine the social distribution of the poorest air quality, we see that the poor enjoy greater benefits than others. Figure 10.7 shows that, of the two million people 'removed' from an NO₂ exceedence ward by air quality improvement, most will be poor. Note however, that the poorest quintile continues to bear over half the NO₂ exceedences that remain in 2010. Plotting the data from Figure 10.7 using Lorenz curves (cumulative distributions), we see that the social inequality in distribution of NO₂ exceedence (wards where annual ward mean NO₂ > 40 ug/m³) declines. Thus air quality improvement leads to a more equitable distribution in peak concentrations.

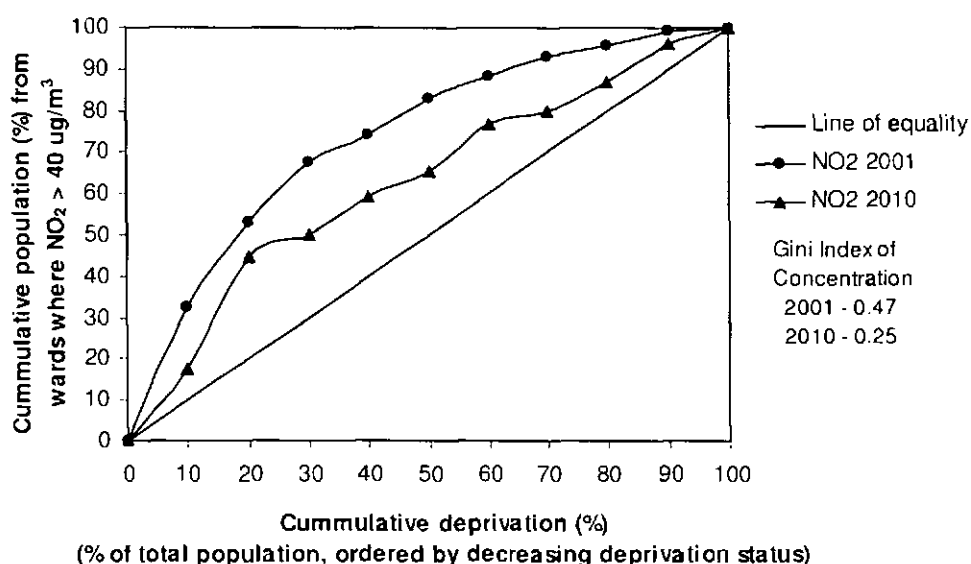


Figure 10.7 Social distribution of high annual ward mean NO₂ (England)

The introduction of tighter air quality standards may lead to an increase in exceedences, and the burden of these new exceedences is likely to be borne disproportionately by the poor (note that changing the standard does not affect actual exposure). This is the case with the 20 ug/m³ PM₁₀ standard to be introduced in 2010 (DEFRA 2003). Figure 10.8 illustrates Lorenz curves for 2001 and 2010, addressing people in wards where annual mean PM₁₀ is forecast to exceed 20 ug/m³. Note that, unlike NO₂, the distribution of peak values

becomes more inequitable. This pattern arises as by 2010, all people resident in wards where $PM_{10} > 20 \mu g/m^3$ are in the poorest three deciles, with none in any other decile. Note however, that overall the total number of people in a PM_{10} 'exceedence' ward falls from 650,000 in 2001 to just 25,000 in 2010.

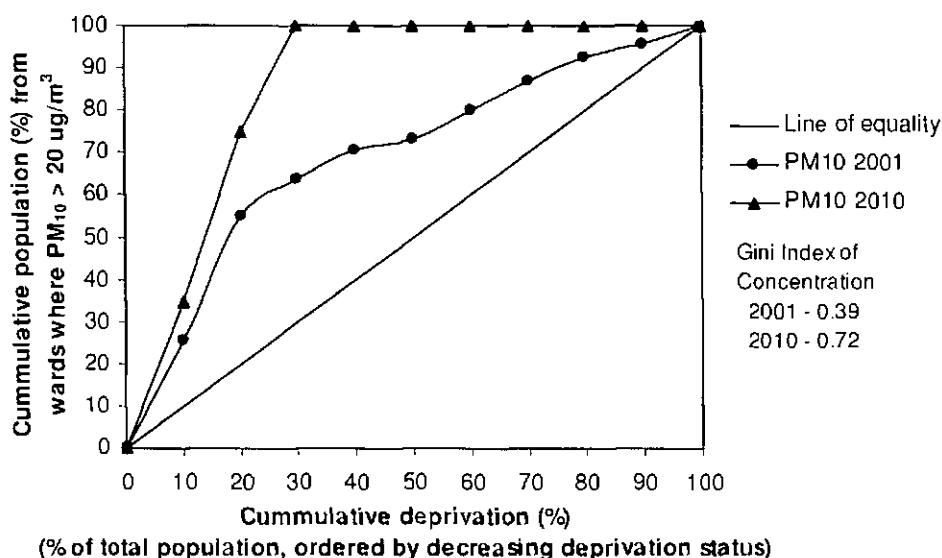


Figure 10.7 Social distribution of high annual ward mean PM_{10} (England)

The temporal analyses illustrates that equity analyses are sensitive to characteristics of the data (e.g. whether thresholds are applied to environmental data) and that results should be interpreted carefully. On balance, our temporal analysis shows that the social distribution of pollution is likely to change little when considering all wards, but that when examining only those wards where air quality is poorest, we find that the social distribution of pollution becomes more equitable. As air quality continues to improve, its social distribution could appear increasingly inequitable. This is because the poorest air quality is largely confined to urban areas which tend to be more deprived. However, these areas will enjoy very much better air quality than at present.

We note that the impact of air quality management area (AQMA) actions is not represented in the NETCEN air quality data. AQMA's are intended to eliminate standard exceedences, and because they are largely in urban areas, should act to make a more equitable distribution. There remains, however, a danger that AQMA's could cause pollution to be redistributed, possibly to more deprived areas.

10.6 Pollution-poverty 'hot spots'

We used the Air Quality Index to identify clusters of wards that have poor air quality ($AQI > 1.5$), and high deprivation (decile 1). We identified around a dozen

of these pollution-poverty 'hot-spots', with large clusters in parts of London, Manchester, Sheffield, Nottingham and Liverpool, and small clusters (< 5 wards) in Bristol, Derby, Essex, Leicester, Luton, Tyneside, W. Midlands and W. Yorkshire. This technique is a useful way of identifying areas for further more detailed analysis and possible remedial intervention. However, the selection of appropriate air quality and deprivation thresholds is a subjective process that merits more widespread discussion and agreement.

10.7 Air quality and social justice

Our analysis has established that there is an unequal social distribution of air quality in both England and Wales, with the most deprived bearing a greater air quality burden than people of average means. However, in both countries the least deprived also bear an above average air pollution burden. This brings into focus the issue of equality and justice. That is, are the observed social distributions unfair? In part, this is a subjective and political decision, which we have discussed at length (e.g. with reference to welfare theory) in the Phase I Project Record (Mitchell and Walker, 2003). However, the air quality analysis highlights several other practical issues which are also pertinent to the wider debate on environmental equality.

First, we note that we do not have agreed means of identifying a social distribution of pollution that most would consider unfair. There is a lack of agreement on appropriate metrics describing target groups, adverse effects (e.g. exceedences or concentrations?), and acceptable inequalities in distribution of adverse effects.

Second, it may be appropriate to consider the issue of polluter pays. Claims that 'traffic pollution is mainly caused by the better off, but the poor feel its effects', have been made but are not empirically supported. Mitchell and Dorling (2003) demonstrated there is no ward level relationship between deprivation and emission, and that the poor contribute just as much NO_x emission as the affluent (they have fewer but older more polluting cars). Inequalities can be identified (e.g. when considering emission, concentration and deprivation collectively), but a more careful interpretation is required.

Finally, we note that freedom of choice is a significant issue in interpreting inequality. The deprived that drive older more polluting cars, for example, may have little choice to do otherwise, due to a lack of access to public transport, and the higher cost of cleaner vehicles. Conversely, those that suffer higher air pollution in urban areas may choose to do so given the greater access to jobs and services, whilst others may be economically constrained to a particular more polluted location, without equivalent compensatory access. Thus in interpreting distributions of air quality (or other environmental 'bads') there is a need to consider the wider distribution of costs and benefits.

10.8 Recommendations

1. Our analysis indicates that there is a strong relationship between poor air quality, and social deprivation. The relationship is particularly strong when considering peak pollutant values, including exceedences of air quality standards, and the upper (population weighted) decile of pollutant concentration. Improving air quality where it is worst, should act to reduce this inequality. We therefore recommend that the Agency extend any necessary support to local authorities seeking to meet NAQS objectives through the designation of air quality management areas (AQMA's).
2. There are numerous mitigation measures that can be adopted in AQMA's to reach NAQS objectives. These may include measures that redistribute emissions (e.g. traffic management). We also note that local transport plans (LTP's) include measures which will impact upon air quality. The distributional impacts of these measures are not widely understood, and there is a need to ensure that they do not produce an undesirable redistribution of pollution to the deprived. We therefore recommend that the Agency, in partnership with local authorities and transport planners, seek to understand the equity implications of AQMA's and LTP's.
3. AQMA's are designated on the basis of exceedence of NAQS air quality standards. However, compliance with a standard does not imply freedom from a health impact. Health impacts can occur at all concentrations (and may have different impacts on different groups), and standards do not adequately address chronic effects. As there is an inequitable burden of air pollution that complies with current standards, there is thus a need to agree on appropriate adverse effect thresholds for use in equity assessment. More generically, there is a need to agree methods for air quality equity appraisal, addressing the issues identified in our report. We therefore recommend that the Agency develop technical guidance on air quality equity appraisal.
4. The Agency should identify critical 'poverty-pollution' areas, and support efforts to improve air quality in these areas. There are various means of identifying these areas (e.g. using different variables and thresholds) hence there is a need here for technical guidance on evaluating inequality in air quality (see 3 above). It is probable that critical areas identified using deprivation plus exceedence data will be addressed by AQMA's. However, this should be verified.
5. In the future, the greatest influence on the changing spatial pattern of air quality, and hence its changing social distribution, is likely to be development, not specific air quality management measures. Therefore, the Agency should promote the inclusion of equity assessment in the appraisal of developments which are likely to impact on air quality. Key partners in this process would include the Highways Agency and planning authorities.

11 OVERALL RECOMMENDATIONS

11.1 Recommendations for policy and practice

1. There is an unequal social distribution of pollution and risk, but a very limited knowledge base upon which to develop appropriate responses. As a matter of general policy, the Agency should therefore continue to support efforts to further understand the nature and significance of such distributions, and aim to identify appropriate measures to reduce inequalities which are unacceptable. Reducing inequalities through an overall reduction in environmental burden, not through the redistribution of existing burdens, is a more sustainable approach.
2. There are currently no standard methods for assessing environmental equality. The lack of agreed methods hampers the identification of inequality, and therefore the development of sound environmental equity policy and practice. The Agency should therefore appoint a technical working group on environmental equity appraisal. The purpose of the group would be to develop, in consultation with appropriate stakeholders, strategic guidelines on the appraisal of environmental equity in England and Wales. The guidelines would be used to: (a) support the appraisal of policy and practice within the Agency; and (b) provide a basis from which the Agency can comment on the equity implications of the policies and plans of external bodies.
3. There is a need for more widespread use of environmental equality assessment. Therefore, the Agency should work with government, local authorities, and other appropriate stakeholders to ensure that environmental equity assessment becomes more widely adopted in the environmental impact appraisal process. Wider recognition of equity issues in environmental appraisal may range from developing environmental equity indicators in government sustainability indicators sets, to specific treatment of equity issues in development appraisal (e.g. in Environmental Impact Statements).
4. Environmental inequality can be tackled by specifically addressing those target communities which bear the greatest proportion of environmental burden, and develop appropriate remediation strategies for those areas. Such strategies may tackle existing inequality (e.g. traffic management to improve air quality), or may minimise the imposition of further environmental burdens (e.g. tighter discharge consents; presumption against planning permission for further hazardous facilities etc.). Through the research summarised here, we have made a preliminary identification of 'pollution-poverty hotspots' with respect to air quality and IPC sites. However, our analyses are based on our own subjective assessment of appropriate thresholds. We therefore recommend that the Agency identify critical 'pollution-poverty' areas, based on criteria agreeable to the Agency and its stakeholders (see 2 above), so as to identify those communities most in need of remedial action. Critical areas can be identified with respect to individual and/or multiple risks, and at the national and/or regional level. Possible remediation strategies are best developed following a more detailed investigation of these critical areas.

5. Questions of environmental equity and deprivation are clearly of particular relevance to communities that experience a high burden of environmental 'bads' of various forms. The Agency therefore needs to develop ways of engaging and working with communities in deprived areas to ensure that their local knowledge and viewpoints are included in policy decisions and management measures. This raises questions of procedural equity which sit alongside and interrelate with those of distributional equity on which we have focused in this project.

11.2 Recommendations for additional research

We have made specific recommendations for further research for each of the three environmental issues covered in this project. In addition there are a number of more generic research needs:

1. further equity analysis for other environmental variables identified as relevant and important by the stakeholder workshop (see Chalmers 2003);
2. further equity analysis examining variables other than deprivation, making use of small scale output area data of the 2001 census. As the census output areas are now postcode based this would also enable the linking of other datasets such as lifestyle data and house price data;
3. case study equity analyses that focus on particular local communities, examining the net distribution of environmental goods (costs and benefits) experienced in that area. Such studies would seek to identify appropriate remediation responses, and to understand the causes of observed environmental distributions, so as to increase the effectiveness of remediation strategies.

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ANNEX 4: Environmental Equality: internal workshop, 14 July 2003



**ENVIRONMENT
AGENCY**

Environmental Equality Research, Policy and Action

Environment Agency workshop – Monday 14 July 2003
Aston Business School, Birmingham

1. BACKGROUND TO ENVIRONMENTAL EQUALITY WORKSHOP

The Environment Agency is developing an R&D programme which aims to understand the links between environmental quality and social deprivation⁵⁴.

A workshop was held on 14 July 2003 to discuss the conclusions of data analysis, how the conclusions can inform the Agency's position on addressing environmental inequalities, and to develop recommendations and next steps for promoting environmental equality. The workshop brought together staff from the Agency's Head Office, Wales, Regional Strategic Units and Areas involved in work relating to three areas of environmental quality; flood hazard, IPC and air quality; social issues, health and community relations.

The workshop aimed to develop:

- Improved awareness and understanding of the relationship between environmental quality and social deprivation; in particular, better understanding of the impacts of- and on air quality, flood hazard and IPC sites
- Improved understanding of how the Agency could take into account any impacts of its activities on environmental inequalities and social deprivation
- Recommendations for Agency policy responses and proposals for further research
- Better working relations within the Agency around the issue of environmental equality and social deprivation

2. KEY CONCLUSIONS & RECOMMENDATIONS

The workshop generated the following conclusions and recommendations:

2.1 The Agency should promote environmental equality because:

[presentation by Helen Chalmers, Social Policy Unit]

⁵⁴ The Environmental Equality R&D programme is managed by Helen Chalmers, from the Agency's Social Policy Team, as part of a work-based doctorate in sustainable development (October 2002-September 2004)

- The links between poverty and the environment are being increasingly recognised by Government and were highlighted in the Prime Minister's speech in February 2003.
- The UK Sustainable Development Strategy states that "everyone should share in the benefits of increased prosperity and a clean and safe environment".
- Section 4 guidance, states that the Environment Agency's contribution to sustainable development is to "protect and enhance the environment in a way which takes account of economic and social considerations". In Wales, this role is strengthened by the requirement to "develop approaches which deliver environmental requirements and goals without imposing excessive costs (in relation to benefits gained) on regulated organisations or on society more widely".
- The Environment Agency's Environmental Vision says that we will need to "be more aware of the social issues raised by our work...for example by understanding the needs of people in poverty who often live in the most polluted neighbourhoods".
- The Environment Agency has a key role – and is making substantial contributions to protecting and improving the environment in areas of poor environmental quality. We can draw on this experience to improve our performance and help reduce environmental inequalities, particularly in deprived areas.
- The quality of the urban environment, where the most deprived areas and poor health are generally found, is improving. However, when compared to improvements in England and Wales overall, poor environmental quality (for example exceedences in air quality standards) tends to be more prevalent in urban areas.
- There are considerable pressures from the Government, the policy community, non-governmental organisations and communities (our customers) to address environmental inequalities. The Agency risks its reputation if this area is not seriously considered its role in addressing environmental inequalities.

2.2 The key relationships between social deprivation and environmental quality are:

Research conducted by Staffordshire University and the University of Leeds on behalf of the Environment Agency⁵⁵ shows that deprived communities often experience disproportionate levels of environmental degradation. Using the Government's Index of Multiple Deprivation and data on air quality, IPC sites and flooding, they found that:

⁵⁵ Environment Agency (July 2003) Environmental Quality and Social Deprivation: R&D Technical Report 12615

Air quality: Deprived communities bear the greatest burden of poor air quality

- In England, the most deprived wards experience the highest concentrations of nitrogen dioxide (NO₂), fine particulates (PM₁₀), sulphur dioxide (SO₂), carbon monoxide (CO), and benzene.
- People in deprived wards are exposed to 41% higher concentrations of NO₂ than those people living in wards of average deprivation.
- Analysis using the air quality index identifies clusters of wards that have poor aggregate air quality and high deprivation; these 'pollution-poverty hotspots' include large clusters in London, Manchester, Sheffield, Nottingham and Liverpool.
- The introduction of tighter air quality standards may lead to an increase in exceedences, the burden of these are likely to be borne disproportionately by the poor

IPC: IPC sites are disproportionately located in deprived areas in England

- There are five times as many sites and authorisations located in the wards containing the most deprived 10% of the population, and seven times as many emission sources, than in wards with the least deprived 10%.
- In deprived areas, IPC sites are: more clustered together; on average produce greater numbers of emissions; present a greater pollution hazard; produce more 'offensive' pollutants; and produce higher emissions of PM₁₀ and carcinogens.
- In Wales, patterns are very different. There is only some bias towards deprived areas found when looking at multiple sites, while emission levels showed some bias towards *affluent* areas.

But this analysis only shows evidence of inequalities in relation to *proximity* to IPC sites. What we don't yet know is the relative exposure to hazard or level of risk associated with deprived areas, and the effects of cumulative pollutant impacts on vulnerable communities.

Flood hazard: Tidal floodplain populations in England are strongly biased towards deprived communities

- There are eight times more people in the most deprived 10% of the population living in tidal floodplains, than the least deprived 10%.
- In comparison, fluvial floodplain populations are weakly biased towards more affluent communities in England.
- The relationships between flooding and deprivation are less distinct in Wales.

But this analysis has looked at people's proximity to floodplains. It takes no account of the risk communities' face, or the level of protection provided by flood defences. This may be better understood by undertaking analysis using the new flood maps currently being developed by the Agency.

Through small workshops on air quality, flood hazard and IPC sites and discussions amongst participants, we found that:

2.3 The analysis tells us that:

- There is sufficient evidence for the Agency to take environmental inequalities seriously.
- The analysis provides a good and useful national picture of environmental inequalities using statistical data. This data provides an effective tool for talking to others, for example: the Regional Observatories, Regional Development Agencies, Local Authorities and business.
- If we want to build trust with local communities, we need to understand better communities' experience and perceptions of poor environmental quality and inequalities. We can do this by drawing on other evidence, such as public surveys of those at risk from flooding; and use models like that used by the Environment Council to help us make sense of different types of information and perceptions.
- We tend to use objective surrogate measures for analysing exposure to environmental risks (eg emissions), rather than indicators which more closely represent deprived communities' perceptions of risk, for example, the number of complaints received about a site.
- There are several limitations of the analysis. It does not tell us about: the actual levels of exposure (eg from poor air quality, and exposure away from home) that communities experience; the actual impacts or effects on health; or the extent of regional inequalities.

2.4 The following policies, process and practices are thought to affect environmental inequalities:

- Environment Agency-regulated activities probably contribute a small proportion of air quality exceedences.
- Many breaches of environmental standards are caused by activities that are not regulated by the Agency. For instance, 75% of air pollution in Port Talbot comes from no-Agency regulated sources (eg transport). Traffic and congestion is thought to be one of the most significant sources of air pollution, and is determined by Highways Agency, Regional and EU policy.
- The legacy of industrial development, regeneration, gentrification, new employment opportunities and in-migration of ethnic minorities have all affected changes in the make-up of neighbourhoods, and therefore who is exposed to poor environmental quality.
- Land use planning acts to protect good quality environments by locating new industrial sites (and therefore new threats to environmental quality) towards areas that are already degraded; and often to direct new sources of employment towards low-income and deprived areas.

- Waste regulations also have a significant effect on where new waste management facilities (eg incinerators or landfills) are located, and therefore who is affected by poor environmental quality.

2.5 The Environment Agency should care about environmental inequalities because:

- the benefits to the environment in tackling inequalities and degraded environments
- the Agency's commitment to sustainable development
- political focus on tackling disadvantage and promoting equality in public services
- our stewardship role in treating people equally
- the opportunities which our five corporate roles give us, for example, the Agency aims to be an 'efficient operator' and an 'influential advisor'
- accountability towards our customers and in using public money

The groups then discussed, 'to what extent to the Agency should and could intervene?':

- The Agency needs to develop an overall approach to addressing environmental inequalities. However, there was considerable scepticism about the value of developing a 'one size-fits all' model as the basis for the Agency's approach.
- The Agency needs to show that it is firm and fair by being consistent in the standards we apply.
- There is tension between the Agency's pre-occupation with 'consistency' in regulation and the need to develop different approaches which allow the Agency to gear its response to local situations (eg by applying different environmental standards, or targeting investment in particular areas).
- The analysis has shown that introducing tighter environmental standards across the country will perpetuate inequalities.
- Applying different [emission] standards across different parts of England and Wales was thought to be an effective way of more equitably spreading the costs and benefits of environmental quality between areas. For instance, different emission standards could be applied in urban and rural areas, or in deprived communities based on their proximity, level of exposure or vulnerability due to deprivation and health status (eg through the application of critical load analysis). However, it was felt that this strategy might be difficult to apply and justify to Agency's customers.
- Targeting areas of disadvantage is an accepted approach for tackling inequalities. The Government's anti-poverty strategy focuses on targeting investment and programmes at deprived areas (eg through Health Action

Zones). The Agency already targets its effort in areas of poor environmental quality.

- The Agency should be accountable for where it (currently and in the future) focuses its efforts, in the light of inequalities. Local Authorities are now required to map their expenditure on public services (eg health, education and environmental services), according to the Index of Multiple Deprivation.
- Human health protection standards are already used to set environmental limits. While some felt that these provided sufficient protection for deprived communities, others felt that health impact assessments should be extended to include an assessment of the equity implications of standards.
- Many participants called for more knowledge about: the health impacts of exposure to poor environmental quality, the implications of changing standards. Others felt that the Agency should take a precautionary approach and not use a lack of data to justify no action.

2.6 The Agency should address environmental inequalities through Agency policies, process and practices by:

- Integrating equality into the policy development process
- Integrating equity into integrated appraisal tools for policy development, project appraisals, and develop technical guidance for Agency staff
- Integrating equality into the Agency's health policy and health impact assessments
- Taking into account local experience in the Areas, and the potential use of equity assessments as part of project appraisals
- Using economic theory and equality to develop approach to flood hazard
- Developing effective targets for Agency staff on equality
- Focusing our influence on Defra, the Treasury, the NRU and other partners
- Putting more effort into influencing transport policies and planning
- Using information on environmental inequalities and the effects of poor environmental quality on deprived communities to influence corporate social responsibility and encourage businesses to consider the equity implications of their business practice on people.
- Develop locally-refined analysis which looks at the complexity between environmental impacts and health
- Providing better information on existing and new sources of risk to environmental quality (for instance for new IPPC-regulated sites)
- Improving the Agency's engagement and communication with deprived communities (eg through staff training)

2.7 The Agency should support others' work to promote environmental equality by:

- Reinforcing the importance of equity to Local Authorities (particularly in relation to Air Quality Management Strategies)

- Sharing examples of good practice on environmental equity, eg from the South West and Wales
- Influencing RDA and EU funding
- Working with Local Authorities to plan ahead
- Supporting other organisations' initiatives on environmental equality, eg the Neighbourhood Renewal Unit's working group on environmental exclusion
- Examining other agencies' approaches to inequality/promoting equality, eg the Countryside Agency, English Nature

2.8 To help promote environmental equality, the Agency should advocate:

- Changes to the current appraisal criteria [uses cost-benefit analysis] for investing in flood defence, so that it takes into account social costs (Government and Agency policies)
- Integration of equity into Strategic Environmental Assessments and Sustainability Appraisals (ODPM)
- Integration of equity into local planning applications through risk assessments (LAs, LGA)
- Integration of environmental equity into evaluation processes for policies, projects and funding (eg EU funding targets)
- Development of a joined-up perspective through the development of Community Strategies and Local Strategic Partnerships (Local Authorities and LSP partners)
- Development of indicators of environmental equity (Government Offices)
- Incorporation of environmental equity measures into the Index of Multiple Deprivation are robust and effective (work with ODPM, NAW, DoH)
- Investigation into the value of using 'poverty-pollution' hotspots to prioritise environmental improvements and regeneration

2.9 What three things would make the most difference to promoting environmental equality?

Agency policies, process and practices
<ul style="list-style-type: none">• Integrate equity into the policy development process• Focus our influence on Defra, the Treasury, the NRU and other partners• Develop locally-refined analysis which looks at the complexity between environmental impacts and health• Provide better information on existing and new sources of risk to environmental quality (for instance for new IPPC-regulated sites)• Improve the Agency's engagement and communication with deprived communities (eg through staff training)
Agency supporting others
<ul style="list-style-type: none">• Reinforce the importance of equity to Local Authorities (particularly in relation to Air Quality Management Strategies)• Influence and utilise funding streams: RDA funding and EU funding• Support for Local Authorities (and our LSP partners) in Developing a joined-up perspective through the development of Community Strategies and Local Strategic Partnerships

Agency advocacy
<ul style="list-style-type: none">• Change the current appraisal criteria [uses cost-benefit analysis] for investing in flood defence, so that it takes into account social costs (Government and Agency policies)• Integrate environmental equity into evaluation processes for policies, projects and funding (eg EU funding targets)• Integrate equity into local planning applications through risk assessments (LAs, LGA)

3. NEXT STEPS

When?	By whom?	What?
2 September 2003	Environmental Policy Unit	Paper to Policy Steering Group to present results of analysis and recommendations for Agency policy responses and next steps
End October	Steering group	Steering group workshop to review analysis and recommendations for Agency policy responses and further research
Continued	HC (and all)	Circulate information to interested staff, including RSU health representatives, Partnership Officers, Data and Information Managers. And in long term, publish information on Easinet
Continued	All	Engage other Agency staff in the debate
October – December	Air quality, Health Policy, Flood Defence, IPC, HC	Policy development on air quality, flood hazard, IPC sites to develop and take forward the recommendations developed at the workshop on 14 July
October – December 03	Helen Chalmers	Case studies which examine how the Agency works to address environmental inequalities in deprived areas
Continued	John Colvin, HC	Involvement in Neighbourhood Renewal Unit study looking at environmental exclusion
Continued	Environmental Policy	Involvement in writing IPPR report on Sustainability and Social Justice
January 2004	Project Board , Helen Chalmers	Paper to Policy Steering Group to present draft Agency policy and position statement on environmental equality

Helen Chalmers
Environmental Policy Unit
August 2003

ANNEXES

(Please contact Helen Chalmers if you would like copies of the following annexes:)

- A. Background, objectives and schedule for Environmental Equality R&D programme (February 2003 – March 2004)
- B. Outputs of Environmental Equality workshop – 14 July 2003
- C. Workshop participants and small groups
- D. Photographs of workshop and groups
- E. Environmental Equality: Introductory presentation by Helen Chalmers
- F. Environmental quality and social deprivation research: Presentation by Dr Gordon Walker
- G. Policy recommendations: Presentation by Dr Gordon Walker

ANNEX A

BACKGROUND, OBJECTIVES AND SCHEDULE FOR ENVIRONMENTAL EQUALITY R&D PROGRAMME [February 2003 – March 2004]

Overview and background

The Environmental Equality project is an initiative of the Environment Agency's Social Policy Team. The overall aim of the project is to strengthen the Agency's contribution to sustainable development by developing a policy position on environmental equality.

Improving environmental quality and tackling inequalities and deprivation are two key priorities for sustainable development. As champion for the environment, in the context of sustainable development, the Environment Agency has a key role in protecting and enhancing the environment in a way which takes account of the "the needs of people in poverty who often live in the most polluted environments"⁵⁶.

There is increasing evidence that the poorest neighbourhoods disproportionately experience adverse environmental impacts⁵⁷. This has highlighted the need for environmental policy to take account of social exclusion. Environment Agency analysis of a number of environmental data sets linked with the Index of Multiple Deprivation concluded that there are strong links between environmental quality and deprivation, particularly in a number of areas for which the Agency has regulatory responsibilities (e.g. IPC sites, landfills, water quality)⁵⁸. However, the report, other research and Agency discussions with policy communities highlight the need for further research and policy development in this area.

Aim and objectives of the Agency's environmental equality programme

The aim of the programme⁵⁹ is to strengthen the Agency's contribution to sustainable development by:

- (i) analysing the relationship between environmental quality and social deprivation
- (ii) critically reviewing how the Agency can address environmental inequalities

⁵⁶ Environment Agency (2001) *An Environmental Vision*, p.10.

⁵⁷ Friends of the Earth (1999) *Pollution injustice: the geographic relation between household income and polluting factories*; Boardman, B., Bullock, S., McLaren, D. (1999) *Equity and the environment: guidelines for green and socially just government*; Friends of the Earth (2001a) *Pollution and poverty – breaking the link*; ESRC Global Environmental Change Programme (2001) *Environmental justice: Rights and means to a healthy environment for all*. Special Briefing No. 7, University of Sussex.

⁵⁸ Environment Agency (2002) 'The urban environment in England and Wales – a detailed assessment'

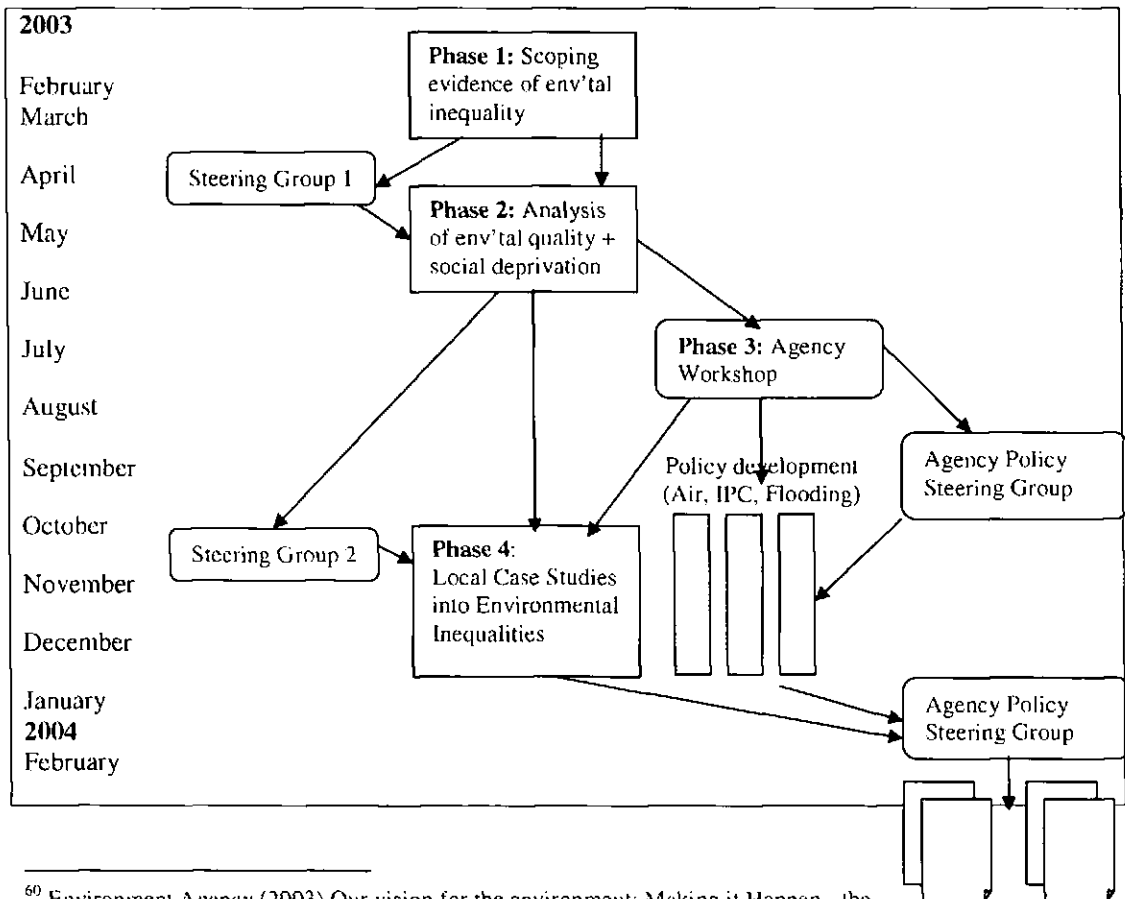
⁵⁹ The Environmental Equality R&D programme is managed by Helen Chalmers, from the Agency's Social Policy Team, as part of a work-based doctorate in sustainable development (October 2002-September 2004)

- (iii) developing a policy position on environment equality

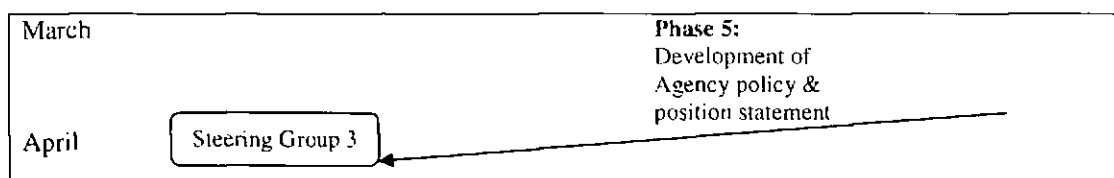
The programme adopts an action research approach and will draw on:

- (viii) quantitative data analysis of the relationship between environmental quality and social deprivation (being undertaken by the Universities of Staffordshire and Leeds) set within a process of multi-stakeholder dialogue
- (ix) rapid social appraisal of the Environment Agency's 46 corporate targets
- (x) comparative analysis of approaches to environmental equality
- (xi) prioritisation of the Agency's engagement with Local Strategic Partnerships "focusing on the 50% where we can most benefit social and environmental capital, including disadvantaged communities and ethnic minorities"⁶⁰
- (xii) case studies to explore the opportunities, implications and risks of addressing environmental equality in key areas of Agency responsibility
- (xiii) development of an Agency policy position on environmental equality
- (xiv) external advocacy of environmental equality eg through working with NRU, DEFRA and other stakeholders

3. Schedule for R&D programme



⁶⁰ Environment Agency (2003) Our vision for the environment: Making it Happen - the Environment Agency's Corporate Strategy: 2002/07. p30.



Phase 1: Scoping Report [February – March 2003] produced by consultants at the Universities of Staffordshire and Leeds, which includes an evaluation of existing research and analysis of the relationship between environmental quality and social deprivation; identification of gaps in existing research; and recommendations for criteria and priorities for further research.

Phase 2: Steering Group & Analysis [3 April 2003, April – June 2003]

Following the recommendations by the Steering Group, the consultants from Staffordshire and Leeds Universities undertook analysis of data sets relating to environmental quality and social deprivation. The analysis focused on three specific issues which were identified as relevant to the remit of the Agency and most appropriate for analysis within this project – air quality, flood hazard and IPC sites.

Phase 3: Internal Agency workshop and working groups [July – December 2003]

An internal workshop was held on 14 July to make sense of the Phase 2 findings and develop recommendations for Agency policy responses and further research. At this workshop it was proposed that further work is developed around the three priority areas: air quality, flood hazard and IPC. The results of the analysis and recommendations will be presented in a paper to the Agency's Policy Steering Group in September 2003. Initial work to be carried out between September and December 2003 will help to develop recommendations and policy responses which will support the Agency's policy position on environmental equality.

Phase 4: Area case studies [October 2003-December 2003] Following the second meeting of the steering group, local case studies will be conducted to examine how the Agency delivers the environmental priorities of deprived areas.

Phase 5: Policy Development [January – March 2004] The internal Agency workshop and working groups will help inform the development of a draft Agency policy and external position statement on environmental equality. The draft policy and position statement will be developed by the steering group and presented to the Environment Agency's Policy Steering Group in January 2003.

ANNEX B STEERING GROUP OUTPUTS

Introductory Presentations

Chair: Pam Gilder, Head of Policy Development & Promotion

Introduction to Environmental Equality: Helen Chalmers, Social Policy Development Officer

Helen Chalmers who is co-ordinating the Agency's research on environmental equality defined 'environmental equality' as, equality of:

- Environmental 'bads' – eg pollution and flood risk
- Environmental 'goods' – eg access to green space, access to environmental information

Helen opened the workshop by identifying some of the key external and organisational drivers for the Agency in promoting environmental equality, including:

- The UK Sustainable Development Strategy which states that "everyone should share in the benefits of increased prosperity and a clean and safe environment"
- The Agency's commitment to "shifting the focus of our contribution to where we can make the greatest difference, especially in low quality and degraded environments"
- The rise in poverty and inequalities
- The poorest people suffer the worst environments
- The importance of the environment in improving local quality of life
- Government policy and programmes for tackling poverty and urban renewal
- Trends in the urban environment since 1990
- Existing Agency research which reveals some relationships between deprivation and: IPC, landfill, nitrogen dioxide emissions and concentrations of particulates
- In addition to other strengths, weaknesses, opportunities and threats (see attachment 2 for Helen's slides).

She pre-empted the afternoon session of the workshop, which would examine the Agency's role in promoting environmental equality, by suggesting that the Agency could look towards its five corporate roles to find ways in which it already does – and can further tackle environmental inequalities, by:

- Targeting poor environmental quality through regulation
- Being an efficient operator by appraising and monitoring the social impacts of our policies
- Influencing and advising on strategic and local planning decisions
- Informing, communicating and engaging with deprived communities
- Championing the environment as part of poverty and regeneration policy and programmes

SESSION 1: Making sense of the analysis

Aim: to build on our understanding of the relationships between environmental quality and social deprivation and to identify the barriers to promoting environmental equality.

Environmental quality and social deprivation research: Presentation by Dr Gordon Walker and Dr Gordon Mitchell

In his first presentation, Dr Gordon Walker provided an overview of the research conducted on behalf of the Agency by his team at Staffordshire University and the University of Leeds. He outlined the six objectives and key stages of the research, which have included; a literature review of existing data and research on the relationship between environmental quality and social deprivation, identifying gaps in the current evidence base and conducting the analysis, the results of which he then went on to describe. From their analysis of the relationship between social deprivation and flood hazard, proximity to IPC sites and air quality, he highlighted the following conclusions:

Air quality

- There is an unequal social distribution of air quality in England and Wales – the patterns are more complex than other studies have found, but the poor do bear the greatest burden of the most adverse air quality
- Air quality improvements will reduce inequality in exposure to adverse air quality, and it is possible to identify areas where air quality improvement would have the greatest impact on promoting equality

Flood hazard

- Tidal floodplain population is strongly biased towards deprived communities in England, less strongly in Wales
- Fluvial floodplain population is weakly biased towards more affluent communities in England
- We need to recognise the limitations of the indicative floodplain maps and ward level analysis conducted.

IPC sites and deprivation

- In England IPC sites are disproportionately located in deprived areas
- In deprived areas IPC sites are:
 - more clustered together
 - on average produce greater numbers of emissions
 - present a greater potential pollution hazard
 - produce higher emissions of PM₁₀ and carcinogens
- In Wales patterns are very different. The only bias found towards deprived areas was using buffer analysis.
- Some bias was found for multiple sites, and emissions levels towards affluent areas.

See Annex E for the slides used by Dr Gordon Walker and Dr Gordon Mitchell in their presentation.

The following questions and comments were raised by workshop participants in response to the presentation:

- Remember that the Welsh Sustainable Development legislation provides wider opportunities for addressing inequalities
- The relationship between IPC sites and deprivation are likely to be comparable to any future analysis carried out on Integrated Pollution Prevention and Control regulated sites – if not a stronger relationship
- No distinction has been made between large and small processes
- Did you do a temporal study on the length of time a site has existed and its relationship with deprivation, because of the potential for different concentrations of people? No, there is no indicator of the length of time a site has existed
- The lack of relationship between deprivation and IPC sites in Wales is due to the fact that most of the IPC sites in the valley's have closed
- In the future, we need to look at the actual exposure to the hazard – not just proximity to IPC sites. It is difficult to look at exposure. One could look at other variables, eg noise.
- What contribution does traffic make to the Air Quality Index? What is the effect of people commuting to other areas and their level of exposure at work?
- Daytime exposure is difficult to analyse, but could be done by looking at 'travel to work' areas and by examining day- and night time exposure. Some Local Authorities have done local studies of this, but is difficult to do at a national level.
- What about rural deprivation – this analysis seems to emphasise urban deprivation and inequalities.
- To what extent is it good to lump-together England's regions – this may mask regional inequalities.

Workshop participants were divided into three groups to examine the following questions, and report their findings to the wider group. The mind-maps produced for this session can be seen below.

1. What are the relationships between social deprivation and:

1.1 Air quality

- Clear links at this level between air quality and deprivation
 - Relationship in Wales was significantly different
 - In exceedence areas there was a very marked relationship with deprivation
 - Despite improvements over time, CI value may get worse
 - Hotspots: 5 major, 9 minor
- [however, the group had various concerns about the data analysis]:
- Analysis of English regions separately may be different – Greater London?
 - Analysis focused on residence, not where people work
 - There is a serious concern about the quality of the data and what it is telling us – spatial reporting errors (see SASU study)
 - Limits to epidemiological analysis

1.2 Flood hazard

[See above]

1.3 IPC sites

- Strong correlation between IPC sites and deprivation in England
- Weaker correlation in Wales – inverse and more complex
- OPRA scores (site management) – no correlation with deprivation

2. What does this tells us?

2.4 Air quality

- Surprise – these effects not greater
- There is sufficient evidence here for the Agency to be taking this seriously
- How did it happen?
- How much should we worry about this social burden?
- Does it matter?
 - evidence of exposure
 - what does impact mean?
 - are levels significantly high for health effects to be significant? – even if exposure is not significant – does it matter? – influence of aesthetics, perceptions

2.5 Flood hazard

- Need for better data at right scale

2.6 IPC sites

- [lack of relationship between OPRA scores and deprivation] reflects firm and fair regulation
- Concern about accuracy of- and dependence on OPRA scores – because of inexperience [of those completing OPRA scores] and time pressures
- Agency needs to focus on more than just regulating industries – eg could have more impact through influence on transport and relative its relative risks to health
- Perception vs 'real' risk
- But [it doesn't tell is] about the actual impact
 - affect on water quality
 - impact of site – depends more on people's perceptions of risk
 - impact of emissions – odour, noise
- Number of complaints [acts as proxy for people's concerns about risk]
 - could be socially profiled – depend on propensity/ability to complain
 - eg unemployed or those at home during day [are more likely to complain]
- Don't understand the synergistic effects [of poor environmental quality]

3. What are your views on why some deprived communities are more affected by environmental degradation than others?

3.1 Air quality

- Significance of indoor air quality – thresholds
- Traffic probably a major issue?
- benzene rich fuels

- car in air quality?
- Most of workforce lived near major industries
- transport infrastructure served this
- that's why traffic pollution is still found in these areas

3.2 Flood hazard

- History (older/poorer homes)
- Today's economics (where else can they go?)
- Own [Agency] investment
- Other economic drivers

4. What policies, process and practices affect these environmental inequalities?

4.1 Air quality

- Agency only contributes a small proportion of input to AQI
- Agency contribution probably significant – in only 15 out of 200 air quality areas
- Highways Agency
- How to do equity appraisals
- EU transport policy
- Planning policy – pressures on population concentration
- Waste planning, waste management regulations – where as well as mix of approaches
- Building and use regulations
- Pressures that keep more deprived populations in poorer quality housing
- IPPC – needs to keep a watching brief – Best Available Technology

4.2 Flood hazard

[see below]

4.3 IPC sites

- Planning
- History – e.g. pull of industry and employment to particular locations = now greater willingness to complain because of less loyalty to site / dependence on jobs – employment acts as compensation = community more accepting of site, e.g. Hull
- Also health *benefits* gained through employment
- New sites – siting of new industry in areas of unemployment
- Planning zones work against deprivation by locating new sites in existing areas of poor environmental quality
- Housing market and population migration – also gentrification process, eg regeneration in Leeds
- Transport policies

The IPC group also highlighted several ways in which we can promote environmental equality:

- Integrating equity into Strategic Environmental Assessments –because SEA's help to gain a holistic view of areas
- Apply different [emission] limits in urban and rural areas depending on proximity to populations
- Apply different limits for deprived communities depending on [vulnerability and] differential affects on health from emissions on poor people with poor health

Whole group discussion

The following comments were made by participants in the plenary session:

- How the Agency value's different types of evidence of inequalities
- The Agency is pre-occupied with consistent regulation – we will need different approaches to enable us to gear our response to local situations
- National analysis provides a national picture – we are restrictive about what we call 'evidence'
- There is a need for an overall model or approach to tackling inequalities
- Data provides a useful tool for taking to others – eg the Observatories
- I don't believe in 'one size fits all'
- The Environment Council has a useful model for engaging with different stakeholders and for making sense of different types of information and experience
- We need to put more effort into engaging more effectively with communities and making sense of what people feel, rather than collecting more data
- Environment Agency consistency vs local decision-making may require different approaches – eg applying different environmental standards
- Public surveys of communities at risk from flooding provide useful information
- People's perception of risk may be greater than the actual risk. We need a balance between the Agency's risk-based regulation and pandering to local perceptions
- While the Agency is a regulator, we also have a stewardship role in making sure that we treat people equally
- The analysis is dealing with surrogates for exposure. We can't deal with aesthetics of sites which lead to public concerns
- The consultants were asked to provide an indication of correlation between environmental quality and deprivation
- We need to be clear that the Agency has a clear remit in this area - we need to question the Agency's legitimacy
- Consistency vs adapting to local circumstance and targeted approaches
- There is strong evidence to justify different regulation in different areas – to justify tighter regulation in some areas – but will be extremely difficult to do
- There is a paradox between the clinical way we are looking at deprivation and inequalities, with the approaches need to build trust with local communities – we should look at the Environment Council's case studies
- We have to be consistent in the standards we apply. We need to be clear about what we can and can't influence, what decisions people can change and the boundary of their decisions
- Are we going for basic standards across the board or a targeted approach? – Are they mutually exclusive? We already know that 90% of government funding is targeted at 10% of areas
- The Agency already targets its effort on areas of poor environmental quality

- Local Authorities are tasked with producing a map of where they are spending money on health, education and services – and overlapping this with the Index of Multiple Deprivation
- The question for the Agency is – “can it defend its existing spending decisions”?
- We need a complete philosophy – not just a quick fix. The solution for deprivation – as with how we tackle different substances is going to be very different – no one solution fits all

Trade-offs

- The environment is only one factor – we may have to consider allowing poor environmental quality in some areas – where there are trade-offs with other factors, eg employment opportunities
- A lot of breaches of standards are nothing to do with us and are from other sources, like transport. In Port Talbot, 75% of air pollution is from non-Agency regulated sources
- Is there anything we can help with – rather than saying “it’s not our fault”?
- We need to regulate industry within the context of the direction the Region wants to go, which is the scale at which you can start talking about trade-offs – by looking at the regional plan and Regional Sustainability Strategy – that’s where the influence is needed

Targeting vs improving overall standards

- In other sectors, like health and education, the Government targets action to tackle inequalities – for example Health Action Zones
- Improving standards for everyone just perpetuates inequalities – we can see that through our analysis which shows that it’s likely that the introduction of increasingly tighter air quality standards may mean that the poor still bear the burden of poor air quality
- Air quality is quite good generally – and is improving overall – so it might not deserve a targeted approach

The Agency's role

- We have talked a lot about the Agency's regulatory role – what about the Agency's other roles – like being an ‘efficient operator’ or ‘influential advisor’ – these are all legitimate roles in repertoire that we can employ. Some of these things are far less ‘tight’ for the Agency than regulation when we are talking about solutions. We can talk about this more in this afternoon’s session when we are going to develop policy recommendations.

SESSION 2: Developing recommendations for policy and practice

Aim: to examine what the Agency can do to promote environmental equality.

Policy recommendations: Presentation by Dr Gordon Walker: Dr Gordon Walker and Dr Gordon Mitchell

To open the afternoon workshop, which aimed to examine what the Agency can do to promote environmental equality, Dr Gordon Walker first examined the policy context in which the Agency was working and some of the issues the Agency should consider in developing its policy.

He then described the recommendations his team had developed based on the results of their analysis for flooding, IPC and air quality. Overall, the researchers recommended that the Agency:

- (i) continue to support efforts to further understand the nature and significance of environmental inequality, and aim to identify appropriate measures to reduce inequalities which are unacceptable
- (ii) appoint a technical working group on environmental equity appraisal
- (iii) work with others to ensure that environmental equity assessment becomes more widely adopted in the environmental impact assessment process
- (iv) identify critical 'pollution-poverty' areas based on criteria agreeable to the Agency and its stakeholders, so as to identify those communities in need of remedial action
- (v) develop ways of engaging and working with communities in deprived areas to ensure that their local knowledge and viewpoints are included in policy decisions and management procedures
- (vi) undertake further equity research into:
 - other environmental variables identified as important at the Environmental Equality Steering Group (held in April 2003)
 - other social variables (age, ethnicity) using 2001 census data
 - case study equity analysis focus on particular communities, examining the net distribution of environmental goods (costs and benefits) experienced in that area.

See Annex F for the slides used by Dr Gordon Walker in his presentation.

The recommendations made by the researchers provided the basis for discussion around the following questions:

Workshop participants were divided into three groups to examine the following questions, and report their findings to the wider group.

5. Do we (the Environment Agency) care?

5.1 Air quality

- Yes – there is sufficient evidence here to tackle this seriously in policy making
- Should + can = must

- Our commitment as an Agency to sustainable development – addressing social inequalities is basis of sustainable development
- To an extent, addressing environmental inequalities will contribute to environmental improvement (but not sure of evidence)
- Limits: how much difference does this make to GDP/economy, health) – what is the job market? Training
- Can we afford to care?
- Do what we currently do differently, eg adding equity appraisal to environmental assessment (like Health Impact Assessments)

5.2 Flood hazard

- Yes. Why?
- Because we have to:
 - political pressure
 - fairness
 - [accountability for the] public purse
- But it's still about the environment, not bridging the social divide
- We need to understand
 - what we do now
 - what happens if we change the rules
 - what happens if we focus less on property and focus more people in their environment

5.3 IPC sites

- Yes
- No – we are already setting limits at health protective standards
 - limited role for Agency?
 - Only set standards where we have knowledge
 - NOx is precautionary
 - How precautionary should we be?
- How far do we go?
 - where do you draw the boundary on expectations
- Need to understand environmental impact
- Be clear and transparent
 - but different if treating areas differently
- Ensure standards are met (whatever the source or impact) – equal standards of environmental quality
- Separate between actual and perceived environmental impact
- Educating
- Informing
- Being better communicators
- Apply critical load analysis – is there a critical load for a deprived community [depending on their vulnerability, ability to cope/adapt,]

6. How should the Agency address environmental inequalities through our own policies, process and practices?

6.1 Air quality

- Agency policy making process – should consider equity

- Make links to Agency's human health policy, eg extend health impact assessment to include (air quality) equity appraisal
- Develop good technical guidance on equity appraisal as part of social appraisal
- In parallel with our policy recommendations, bring Areas with us – take into account local thinking with project appraisal checklists (internal policy + advocacy)
- Think about targets – what targets would be credible/viewed as effective to Agency staff

6.2 Flood hazard

- Target (influence): Defra, Treasury, NRU, other partners
- Use economics

6.3 IPC sites

- Provide better information on existing and new sites
- Get better at engaging and communicating with deprived communities
 - ensure staff speak the same language
 - Environmental Protection Officers don't have the necessary interface with communities
 - need for training
 - how do we build trust with the communities?
- Use information on environmental inequalities to influence corporate responsibility and equity implications of business practice
- Need to develop locally refined analysis which looks at complexity between environmental impacts and health

7. Are there any examples of work others are doing to promote environmental equality that the Agency should be supporting?

7.1 Air quality

- Reinforce equity message in our relationship with Local Authorities working on National Air Quality Strategies (and that we are committed too)
- Spread Agency good practice (eg in South West and Wales) in this area – across the board

7.2 Flood hazard

- RDA funding
- EU funding (Cornwall)

7.3 IPC sites

- Put more effort into transport (rather than IPC) for major wins
 - only advise on bits which affect the Agency eg water quality
 - strong economic arguments
- Working with local authorities to plan ahead
- Support other organisations' initiatives on environmental equality – eg the Neighbourhood Renewal Unit's study
- Examine other agencies' approaches to inequality/promoting equality – eg the Countryside Agency, English Nature

8. What should the Agency be advocating to others that will help to promote environmental equality

8.1 Air quality

- Pressing Government to change cost-benefit analysis to take into account social costs (ie for flood defence, ask Ronan Palmer), but informally with other functions (internal culture) too
- Promote the inclusion of equity assessment in the (Strategic Environmental Assessment/Sustainability) appraisal of developments likely to impact on air quality - advocacy with ODPM
- Work with ODPM / National Assembly for Wales to ensure environmental equity measures that are incorporated into the Index of Multiple Deprivation are robust – make links with health/Department of Health/NAW
- Engage in regeneration agenda and through this, decide on the value of “poverty-pollution” hotspots as a prioritisation tool
- Rural poverty/regeneration hotspots? (seasonal issues)

8.2 Flood hazard

- Get involved in others' evaluation process eg EU funding targets & political process

8.3 IPC sites

- Influence [development of] environmental variable of [revised] Index of Multiple Deprivation
- Equity appraisal at planning stage with risk assessment (but difficulties with applicants providing information at planning stage)
- Use of Strategic Environmental Assessment – interface with planning – move towards sustainability assessments (but what about process – avoid the ‘tick box’ mentality)
- Get Local Authorities to have joined up perspective (Local Government Act duty to join up through development of Community Strategies and Local Strategic Partnerships) –because Local Authorities have the local interface - hold LAs to account for decisions/what they deliver [for environmental equity]
- Role of Government Offices in examining ‘what does success look like’ – through development of indicators

9. What three things would make the most difference to promoting environmental equality?

The three workshop groups highlighted the following priorities for the Agency, which they felt would make the greatest difference to promoting environmental equality:

	Agency policy & process	Supporting others	Advocating (policy position)
Air quality	Integrate equity into Agency policy development process	Reinforce equity message in our relationship with Local Authorities working on National Air Quality Strategies (and that we are committed too)	Press Government to change cost-benefit analysis to take into account social costs (eg for flood defence), but informally with other functions (internal culture) too
Flood hazard	Target: DEFRA, Treasury, NRU, other partners Use economics	Utilise funding streams: RDA funding and EU funding (eg as in Cornwall)	Influence others' evaluation process eg EU funding targets & political process
IPC	Better information provision on new IPPC sites, with better engagement and communication with deprived communities Local analysis which examines complexity between environmental impacts and health	Support Local Authorities in developing a joined-up perspective for decision-making (as outlined in duties through Local Government Act) through development of Community Strategies and Local Strategic Partnerships	Integrate equity into appraisal mechanism at planning stage with risk assessment

Other comments

9.1 Air quality

- We can't do advocacy without engaging with other collaborators
- Has anyone done anything on Cost-Benefit Analysis?
- Henry Leveson-Gower has done work with Regional Development Agency's

9.2 Flood hazard

- We need to 'people' the environment – people are the actors we want to influence, and it's people who are affected by flooding – we need to put less emphasis on property – and more emphasis on people
- To what extent are social issues on the operational radar?

9.3 IPC sites

- We can use information on inequalities to help with influencing business – naming and shaming them on their impacts on vulnerable communities and to help promote corporate social responsibility
- We need to be careful of the blight issue – that by identifying 'hotspots', we don't affect the opportunities of an area
- Blighting communities is less of an issue when we're talking about national analysis

Whole group discussion

- Influence on planning applications
- Have we improved our ability to influence planning?
- The Agency is not very good at directing applicants towards doing adequate health impact assessments. The new landfill crowd are struggling with what is an adequate health impact assessment
- We doing it [getting planning applicants to do adequate health impact assessments] in Wales, but we still have problems with old sites

How much should we care?

- We're still about creating a better environment for people – not about affecting the social divide
- There is an important role for regional government
- We need to get local authorities and regional government to see health as part of the wider picture in delivering a good quality environment
- The relevance of environmental equity shouldn't be a problem to get over – it's getting our own people to understand it
- Part of the challenge is changing out language to meet others' agendas
- Equity requires a change in ethos
- We have been involved in the development of a policy integration tool with the National Assembly for Wales where it's viewed as part of the sustainability appraisal system – it may be introduced into the Agency
- In Wales we engage actively in transport planning – I think this is less true in England. We may shoot ourselves in the foot if we don't.
- It will increase our legitimacy in this field if we ensure that Strategic Environmental Assessment helps us

Next steps

The group discussed how to take this work forward in light of the priorities identified above and the next steps outlined by Helen Chalmers earlier in the day:

- (i) Sept 2003: Report results of analysis, recommendations and priorities identified by workshop to Policy Steering Group
- (ii) October: Report back to external stakeholders involved in Steering Group (which met in April and) who helped develop priorities for the data analysis
- (iii) Take forward the recommendations developed at today's workshop on promoting environmental equality through IPC, Flood hazard and Air quality
- (iv) Sept-Dec: Further environmental equality research to be undertaken by Helen Chalmers
- (v) Continued working with the Neighbourhood Renewal Unit and their cross-departmental working group on 'environmental equity'
- (vi) Reconvene this group of Agency staff?
- (vii) Submit draft policy position on environmental equality to the Policy Steering Group

Comments on Next Steps

- It's not necessary for this group to meet again – but what do you think about using this group as a network for information and developing our policy position?
- For IPC and air quality we need to be engaging others in the debate and bringing others up to speed
- We need to continue engaging with the Neighbourhood Renewal Unit and getting the environment onto their agenda
- More leverage is needed in flooding
- For IPPR – a report is due next year, and we are influencing on an international stage
- Regional State of the Environment reports are done in partnership with Regional partners
- Field information to regional health representatives – the National Assembly for Wales and the Regional Strategic Units have an obligation to promote health issues
- In the long-term – get something [information, guidance, policy positions etc] on the Agency's Intranet site
- Keep the Partnerships Officers informed of developments
- The Building Trust in Local Communities project is developing guidance for Regions
- To launch a policy position, identify a group of champions for each Region
- Identify what it [the Agency's position on environmental equality] will mean at an influencing role at Area level
- Engage in the current review of Flood Defence mechanisms
- Jim Storey is co-ordinating the development of a strategic approach to air quality and is preparing a paper for sign-off by October
- The Agency has been involved in developing the National Assembly for Wales' Business and Environmental Action Plan, which includes the development of a sustainability appraisal tool – which ties in with influencing IPC and provides a forum for floating issues to business
- Jim Poole is preparing teaching material for engineering students based on Environment Agency case studies. This will involve developing role plays where the students are required to put themselves into the position of the various stakeholders involved. It is envisaged that this material will be equally relevant for use within the Agency as we seek to open out the social debate on issues that are currently seen as primarily technical. If you are interested in helping with this initiative, please see the attached briefing note and get in touch with Jim direct.
- Alastair Gordon will forward any information to the regional Data and Information Managers
- We need to develop a provisional policy position
- The Government's Foresight programme, in which Sir John Harman is involved in the stakeholder group provides a virtual group
- We will need to develop different relationships with those in IPC, Air Quality and Flood Defence

ANNEX C: Workshop participants & small groups

Name	Title	Function / Area / Region
Helen Chalmers	Social Policy Development Officer	Environmental Policy
Jonathan Chapman	Policy Manager	Flood Defence
John Colvin	Social Policy Manager	Environmental Policy
Pam Gilder	Head of Policy Development & Promotion	Environmental Policy
Alastair Gordon	Regional Data, Information and Assessment Manager	South West Regional Strategic Unit
Michael Guthrie	Head of Customer & Community Relations	Corporate Affairs
Ian Haskell	Regulatory Policy Manager	Process Industries Regulation
Jimi Irwin	Head of Centre for Risk & Forecasting	Environmental Policy
Jane Kinniburgh	Environmental Assessment & Reporting Manager	Planning & Reporting
Roger Milne	Strategic Environmental Planning Advisor: Health, Chemicals Policy	Wales Strategic Unit
Dr Gordon Mitchell	Senior Researcher	University of Leeds
Lesley Parsons	Strategic Environmental Planning: Principle Officer	North West Regional Strategic Unit
Jim Poole	Sustainable Development Manager	Wales Strategic Unit
Hanna Strom	Partnerships Officer	South East Area, Thames RSU
Barbara Tate	Regulatory Team Leader, Process Industries Regulation/RSR)	South West Area, Wales
Jean Varley	Corporate Affairs Manager	North East Regional Strategic Unit
Dr Gordon Walker	Director of Institute for Environment & Sustainability Research	Staffordshire University

Group 1: Flood Hazard

Facilitator:

Pam Gilder

Jonathan Chapman

Alastair Gordon

Mike Guthrie

Hanna Strom

Jim Poole

Group 2: IPC

Facilitator:

Helen Chalmers

Ian Haskell

Jane Kinniburgh

Barbara Tate

Jean Varley

Gordon Walker

Group 3: Air Quality

Facilitator:

John Colvin

Jimi Irwin

Roger Milne

Gordon Mitchell

Lesley Parsons

ANNEX D: Photographs of workshop and groups

Group 1: Flood hazard



Group 2: IPC



Group 3: Air quality



ANNEX E Environmental Equality: Introductory presentation by Helen Chalmers [Not included for the purposes of this report]

ANNEX F Environmental quality and social deprivation research: Presentation by Dr Gordon Walker and Dr Gordon Mitchell [Not included for the purposes of this report]

ANNEX G Policy recommendations: Presentation by Dr Gordon Walker and Dr Gordon Mitchell [Not included for the purposes of this report]

ANNEX 5: Environment Agency response to ODPM consultation on updating the Index of Multiple Deprivation 2000, 7 November 2003



**ENVIRONMENT
AGENCY**

**RESPONSE TO OFFICE OF THE DEPUTY PRIME MINISTER
CONSULTATION**

UPDATING THE ENGLISH INDICES OF DEPRIVATION 2000

SUMMARY

The Environment Agency welcomes the opportunity to contribute to this consultation and the proposals for strengthening the Index with broader indicators of deprivation. In particular, the Agency supports the development of a new 'Living Environment' domain which we believe complements the existing social and economic indicators of deprivation and the Government's vision for neighbourhood renewal and sustainable development.

As environmental regulator for England and Wales, with responsibility for improving and protecting air, land and water quality and flood risk management, the Agency's primary interests lie in the proposed 'outdoor living environment' indicators. Our response reflects these responsibilities and our view that deprived neighbourhoods should be revitalised by tackling local environmental issues and addressing environmental inequalities alongside social and economic problems. We recommend that:

- The outdoor living environment domain is given equal weight to the indoor living environment, when the two sub-domains are combined;
- Air quality and road traffic accidents are good indicators for deprivation and the quality of the outdoor living environment;
- Air quality deprivation is indicated by actual concentrations of pollutants;
- Further consideration is given to wider aspects of the physical environment which are important to deprived areas, both for this and future reviews of the Index;
- The ODPM considers the inclusion of indicators of local environmental quality and flood hazard.

1.0 INTRODUCTION

1.1 The Agency welcomes the proposals for broadening the Government's view of deprivation in line with the issues deprived communities face and the objectives set out in the UK Sustainable Development Strategy 'A Better Quality of Life'. The Agency considers the review an indication of the Government's commitment to meeting its sustainable development objectives, in particular Objective H4 'Poverty and Social Exclusion' and Objectives H9 to H14 for effective protection of the environment.

1.2 The Agency contributes to sustainable development and regeneration in deprived areas through its role in improving and protecting the environment, which was outlined in 'Our Urban Future' (September 2002). In this document, the Agency highlighted the importance of a

good quality environment for people's quality of life and how deprived neighbourhoods should be revitalised by tackling local environmental issues and addressing environmental inequalities alongside social and economic problems.

1.3 In this document we reported how deprived communities, who already experience other aspects of deprivation through lower incomes, poor health and crime, also suffer the poorest environments. Accordingly, the Agency supports the introduction of indicators that reflect the environmental deprivation experienced by both rural and urban communities.

1.4 In its position on 'Achieving Environmental Equity through Neighbourhood Renewal', the ODPM outlines three aspects of environmental equity:

- environmental protection (eg construction, waste, design, pollution control)
- local place (graffiti, litter, fly-tipping, noise, road safety, community involvement)
- access to environmental goods (eg fuel poverty, transport, biodiversity)

The Environment Agency recommends that the living environment indicators reflect these distinctions, and also take into account the findings of the cross-governmental Environmental Exclusion review managed by the Neighbourhood Renewal Unit.

2.0 WEIGHTING OF INDOOR & OUTDOOR LIVING ENVIRONMENT SUB-DOMAINS

The Agency supports the combination of the indoor and outdoor living environment sub-domains, but believes that they should be given equal weighting, ie 50:50%. The effects and risks and hazards caused by the environmental indicators for the indoor and outdoor environment are not comparable, and can therefore not be assessed on the basis of the proportion of time people spend indoors or outdoors.

3.0 OUTDOOR LIVING ENVIRONMENT SUB-DOMAIN

3.1 Aspects of environmental deprivation

As the environmental regulator of air, land and water quality, the Agency welcomes the introduction of a 'outdoor living environment' sub-domain, and the recognition given to how many people are deprived by the quality of their local environment.

These links were clearly made in 'Our Urban Future', in which we reported on analysis which revealed relationships between social deprivation (as defined by the existing Index of Multiple Deprivation 2000) and important aspects of environmental protection. This and further analysis (to be published in November 2003) shows deprived communities in England suffer the worst air quality, and are more likely to live on tidal floodplains and near to polluting industrial sites (managed under Integrated Pollution Control regulations). For this reason, the Agency welcomes the proposed outdoor environment indicators, but recommends that further consideration is given

to wider aspects of the physical environment which are important to deprived areas, both for this and future reviews of the Index.

3.2 Air quality (2001, Source: Geography Department at Staffordshire University and NAEI modelled at SOA level)

The Agency welcomes the inclusion of air quality as an indicator of the outdoor living environment, which supports the Government's commitment to improving the air quality in deprived areas.

Our own research has shown strong relationships between air quality and deprivation in England, where the most deprived wards experience the highest concentrations of nitrogen dioxide (NO₂), fine particulates (PM₁₀), sulphur dioxide (SO₂), carbon monoxide (CO), and benzene. People in deprived wards are exposed to 41% higher concentrations of NO₂ than those people living in wards of average deprivation (Environment Agency, September 2003).

It is important to note that road transport is the dominant source of air pollution, and so rural communities are likely to be seen as less deprived than urban communities due to their lower exposure to airborne-related traffic pollutants. What is not clear is how the different air pollutants will be chosen or combined, given that they have different effects, and there is a lack of adequate small area national data for lead or 1,3-butadiene.

Air concentrations provide a better indicator of the impact of different sources of air quality on small areas than emissions indicated by the NAEI. For instance, pollution from industrial sources or road traffic may be localised within a small area or dispersed across a large area. Such data is available at 1km² centroids and can be viewed at the NETCEN website (www.airquality.co.uk), and has, we believe been allocated at smaller scale SOAs by the University of Warwick.

3.3 Road traffic accidents involving injury to pedestrians and cyclists

The Agency supports the inclusion of road traffic accidents, the recognition it gives to the health impacts of road transport and contribution to the Government's floor target on reducing the high incidence of those killed by road accidents in disadvantaged communities.

3.4 Local environmental quality

As the Government highlighted in 'Living Places – Cleaner, Safer, Greener' (October 2002) and the NRU's subsequent position on environmental equity, litter, graffiti and fly-tipping all represent aspects of access to environmental quality that are important to deprived areas. Consideration should therefore be given to the inclusion of a composite indicator of local environment quality, such as that recently developed by ENCAMS and now being used by local authorities (see www.encams.org).

3.5 Flood risk

Flood risk should also be included as an indicator of deprivation. Recent flooding events have highlighted the social, economic and health impacts of flooding on deprived communities, who are more vulnerable and less able to cope with the long term physical and psychological impacts following flooding. 1.8m properties in England lie in floodplain areas, and there is evidence that many of the people living in these properties do not have insurance.

In its report to Government, the Institute of Chartered Engineers Presidential Commission on Flooding called for the human costs of flooding to be built into decision-making. The Agency has developed a Social Flood and Vulnerability Index⁶¹ in order to include social factors in decision-making for flood risk management, which reinforces these links between flood risk and deprivation. This Index, which combines flood risk, social and economic deprivation indicators, has been published for England and Wales and will be used for catchment flood management planning.

Together with other factors, incorporating flood risk into the Index of Multiple Deprivation will provide better representation of the aspects of the physical environment that affect deprived communities.

The Environment Agency is happy to discuss this and the other recommendations made in this consultation response.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The Agency welcomes the proposed strengthening of the Index of Multiple Deprivation (2000) and considers that it will make a significant contribution to sustainable development through the inclusion of new living environment domain. On this basis, the Agency recommends that:

- The outdoor living environment domain is given equal weight to the indoor living environment, when the two sub-domains are combined;
- Air quality and road traffic accidents are good indicators for deprivation and the quality of the outdoor living environment.;
- Air quality deprivation is indicated by actual concentrations of pollutants;
- Further consideration is given to wider aspects of the physical environment which are important to deprived areas, both for this and future reviews of the Index; the ODPM considers the inclusion of indicators of local environmental quality and flood hazard.

FURTHER INFORMATION

Further information or background to this response can be obtained from Helen Chalmers, Social Policy Development Officer, Environmental Policy Unit, Environment Agency, Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, BS32 4UD; tel: 710 5554 (int), 01454 20 5554 (ext); helen.chalmers@environment-agency.gov.uk.

⁶¹ Tapsell, S.M, Penning-Rowse, E.C., Tunstall, S.M. and Wilson, T.L. (2002) Vulnerability to flooding: health and social dimensions. Flood Hazard Research Centre, Middlesex University, Phil Trans, R. Soc, London, A, 360, pp 1511-1525.

ANNEX 6: Paper to the Policy Steering Group, 8 December 2003

FOR POLICY STEERING GROUP USE ONLY

08/12/03 - ITEM: 2.3

PAPER SPONSORED BY: HEAD OF ENVIRONMENTAL POLICY

TITLE: ADDRESSING ENVIRONMENTAL INEQUALITIES

RECOMMENDATIONS

The Policy Steering Group (PSG) is asked to:

1. Note our progress on clarifying the links between environmental quality and social deprivation and support the proposals for future research in this area (section 2);
2. Discuss, and provide a steer on the proposed response to the research findings (section 3);
3. Agree the development of a policy position on addressing environmental inequalities, for review by PSG in March 2004 (section 4).

1.0 INTRODUCTION

- 1.1 In June 2002, we reported on Agency analysis which looked at the links between environmental quality and social deprivation, which was later published in 'Our Urban Future' report. Policy Steering Group agreed that while the analysis had "shown a correlation between social deprivation and the environment ... more work was needed".
- 1.2 Since then, a research programme led by Environmental Policy, and involving external stakeholders, has undertaken further work to understand these links and what the Agency's, and others, role should be in addressing environmental inequalities. This paper sets out the results of this recent research and outlines an Agency response to the emerging conclusions.

2.0 RESEARCH RESULTS

- 2.1 We have conducted further data analysis on the relationships between social deprivation and three aspects of environmental quality: air quality, IPC sites and flood hazard. The research has shown that:
- 2.2 **In some parts of the country, deprived communities bear the greatest burden of poor air quality**
 - In England, the most deprived wards experience the highest concentrations of nitrogen dioxide (NO₂), fine particulates (PM₁₀), sulphur dioxide (SO₂), carbon monoxide (CO), and benzene. People in deprived wards are exposed to 41% higher concentrations of NO₂ than those living in wards of average deprivation.

- In Wales, although air quality is generally better, pollution concentrations are highest in the least deprived wards.
- Analysis using the air quality index identifies clusters of wards that have poor aggregate air quality and high deprivation; these 'pollution-poverty hotspots' include large clusters in London, Manchester, Sheffield, Nottingham and Liverpool.

2.3 IPC sites are disproportionately located in deprived areas in England

- There are five times as many sites and authorisations located in the wards containing the most deprived 10% of the population, and seven times as many emission sources, than in wards with the least deprived 10%.
- In deprived areas, IPC sites are:
 - more clustered together
 - on average produce greater numbers of emissions
 - present a greater pollution hazard
 - produce more 'offensive' pollutants
 - produce higher emissions of PM₁₀ and carcinogens.
- In Wales, patterns are very different. There is only some bias towards deprived areas found when looking at multiple sites, while emission levels showed some bias towards *affluent* areas.

2.4 Tidal floodplain populations in England are strongly biased towards deprived communities

- There are eight times more people in the most deprived 10% of the population living in tidal floodplains, than the least deprived 10%.
- In comparison, fluvial floodplain populations are weakly biased towards more affluent communities in England.
- The relationships between flooding and deprivation are less distinct in Wales.

2.5 From this research and the evidence presented in 'Our Urban Future', we see increasing evidence of a link between some environmental problems and deprived communities in some parts of the country. We also know that these communities tend to be more vulnerable because they suffer poorer health and housing. They also tend to be more excluded or unable to participate in decision-making processes which affect their lives.

2.6 However, our analysis only shows evidence of inequalities in relation to *proximity* to IPC sites and flood plains. What we don't know yet is the *relative exposure to hazard or level of risk*, particularly for those sectors that show the strongest correlations (eg waste). Furthermore, given the potential for cumulative or synergistic impacts of environmental degradation, it is not clear what this means for people's health or quality of life in deprived areas.

2.7 We now need to undertake more research in three key areas: (i) using the new floodplain maps to investigate the level of flood risk experienced by – and level of protection given to – deprived communities; (ii) looking in greater detail at the IPC sectors, such as waste, which showed the strongest correlations with deprivation; and (iii) get a better understanding of the cumulative pollutant impacts on deprived communities.

2.8 **Policy Steering Group is asked to note the links between environmental quality and social deprivation and to support the proposals for further research in this area.**

3. AGENCY RESPONSE TO THE RESEARCH

2.10 The results of the research, which was completed in July 2003, should be published before Christmas.

2.11 Although the relationship between deprivation and poor environments is not always clear we do need to respond to the growing body of evidence we have collected. There is growing political interest in this area of work – both the Prime Minister and Margaret Beckett have referred to these issues in recent speeches. NGOs, like Friends of the Earth, are starting to campaign for change and question our position on environmental inequality. The Neighbourhood Renewal Unit has been asked to look at how all parts of government are helping to tackle disadvantage and environmental exclusion. Defra is beginning to set out a programme of work in this area. We need to be able to demonstrate sensitivity to this new policy area and understand the contribution we can make.

2.12 Our overall position should be to play our part in reducing environmental inequalities. As the Government's principal advisor on the environment we should work with Government to deliver a better environment for everyone, whatever their background. But we must also recognise the limitations of what we can do on our own. Many of our regulatory responsibilities are set within a tight legal framework, where we cannot take a wider social perspective in the environmental decisions we make. In some areas, such as air quality, where transport is the main reason for declining standards, others have the lead role. However, there are opportunities for us to use the Government's interest in inequalities to highlight the environmental dimension, identify the role of others in improving local environmental quality and in doing so deliver a better quality of life for disadvantaged communities.

2.13 In practice this means:

3.41 **Doing what we can to reduce environmental inequalities and to ensure that we do not inadvertently contribute to further inequalities overall.** Since our room for manoeuvre is limited, we need to concentrate on those areas where we can exercise discretion. We are already taking action to address inequalities in some of our work, for example we have developed a Social Flood and Vulnerability Index as a way of including social factors in decision-making for flood risk management. We should now:

- examine how deprivation issues can be integrated in the environmental decision making tools that we use to guide our work, such as risk assessment, policy appraisal and Strategic Environmental Assessment;
- as part of our approach to modern regulation, scrutinise our compliance and enforcement process to ensure that we are doing what we can to reduce risks in deprived communities;
- agree how deprivation criteria might best be used to inform and shape strategic prioritisation and resource allocation for flood risk management.

3.42 Ensuring the environment is recognised as an important dimension of disadvantage in national, regional and local strategies. We have already argued that aspects of the outdoor environment be integrated into the revised Index of Multiple Deprivation (IMD) which is used to target Neighbourhood Renewal and regeneration funding in deprived areas. We should follow this through by ensuring initiatives that tackle deprivation target the worst environments.

- We will work to integrate the environment into cross-Government strategies on deprivation and inequality. We are already a key partner in the Neighbourhood Renewal Unit's cross-governmental review of environmental exclusion and are developing links across Government, through Defra as part of our input into the Spending Review 2004 and future review of the UK Sustainable Development Strategy;
- We will continue to facilitate a broad network of stakeholders from national, regional and local government, NGOs and academics, to help us understand and shape the wider government policy framework for addressing environmental inequalities;
- We will continue our work with Local Strategic Partnerships (LSPs), giving priority to those in disadvantaged areas. We are already working with 75 of the 87 LSPs funded through the Neighbourhood Renewal Fund in England, and in Wales, by working with 16 of the 21 Community First Programme Pockets of Deprivation (linked to Corporate Strategy target).

These will all provide more leverage to our argument for improving environmental quality, but could backfire if we are not seen to act ourselves.

3.43 Working harder to encourage participation of deprived communities in environmental decision making, so that they are given appropriate information and better involved in decisions that affect them. Our priorities should be to:

- develop ways to enable deprived communities to participate more effectively in decisions about their environment (eg for River Basin Management Plans);
- continue to provide high quality environmental information to enable citizens to take better informed action on behalf of the environment (eg Pollution Inventory);
- provide targeted support for Agency staff to improve their communication and engagement with deprived communities, working alongside Corporate Affairs 'Building Trust with Local Communities' programme;

- provide support to Defra's work on developing a more effective and inclusive environmental justice system.

Policy Steering group is asked to discuss and provide a steer on this emerging programme of work.

4. NEXT STEPS

- 4.1 Drawing on this initial steer and the research we have undertaken, we propose to bring a policy position to PSG in March 2004, which will outline the Agency's position on and response to environmental inequalities.
- 4.2 Policy Steering Group is asked to agree the development of a policy position on addressing environmental inequalities for discussion by the PSG in March 2004.

5. RECOMMENDATIONS

In summary, the Policy Steering Group is asked to:

- 5.1 Note the progress on clarifying the links between environmental quality and social deprivation and support the proposals for further research in this area;
- 5.2 Discuss and provide a steer on the proposed response to the research findings;
- 5.3 Agree the development of a policy position on addressing environmental inequalities, for discussion by the PSG in March 2004.

PETER MADDEN
HELEN CHALMERS

Head of Environmental Policy
Social Policy Development Officer

26 November 2003

ANNEX 7: Environment and social justice in draft UK Sustainable Development Strategy, April 2004

7. Environment and social justice

- 7.1 The 1999 strategy included the principle of 'putting people at the centre'. This means thinking about people's social, economic and environmental needs and trying to meet all three in an integrated way.
- 7.2 In both developed and developing countries it is clear that people's health, livelihoods and their environment are strongly linked together, and there was recognition at WSSD of the need to create strong linkages between commitments to address these issues at the international level and strategies and programmes here in the UK. Often, people's basic needs for nutritious food, clean water, safe communities, access to modern energy supplies and decent homes can depend upon a healthy environment. Many millions of the world's poorest people do not have access to clean water, basic foods, fuel, fair trade and decent homes. Developing countries are often more vulnerable to the effects of climate change and are not always able to deal with extreme weather.
- 7.3 Recent research has shown that in England, people in the most deprived areas experience the worst air pollution (for example, they are exposed to 41% higher concentrations of the pollutant nitrogen dioxide than people living in wealthier areas), and are near to more sites producing a greater number of emissions that present a greater hazard. Research has also shown that children living in the most deprived areas are five times more likely to be killed as a pedestrian than children living in the least deprived areas; and also that people from ethnic minorities suffer more road accidents. Other research has found that some groups in the community have poor access to legal advice and support for addressing environmental issues. It is also widely recognised that inequalities like these can affect people's health, safety, sense of community and even local job opportunities. Tackling these environmental inequalities can therefore help improve quality of life overall.
- 7.4 We have put in place strategies to create decent places, reduce poverty, exclusion and health inequalities, improve local environmental quality and close the gap between the worst off and the rest. The UK Government's Sustainable Communities Plan set out a vision for creating thriving communities – places people want to live, not leave – and its *Opportunity for All* report outlines progress on tackling poverty and social exclusion in the UK, including the work done to address poverty issues for the young, the elderly and the disabled. *Social Justice, A Scotland Where Everyone Matters* sets out Scotland's approach to reducing social disadvantage along with key indicators of progress. The Welsh Assembly Government's *Communities First* programme seeks to tackle the problems of Wales' most disadvantaged communities.
- 7.5 Whilst much has already been achieved we need to consider what more can be done to ensure people are not unduly disadvantaged and have access to the decent environments, environmental services and goods that they need.

Questions

Q15 How should we bring together 'environment' and 'social' concerns at national, regional or local level?

Q16 What more could be done to tackle environmental inequalities?

ANNEX 8: Air Quality & Social Deprivation: Paper National Society for Clean Air Conference, 22 April 2004



ENVIRONMENT AGENCY

Air Quality & Social Deprivation

Pam Gilder

Head of Policy Development & Promotion

Why the interest in environmental quality and deprivation?

"the environment, not just globally, but locally, in our towns and cities, is overwhelmingly an issue of concern for the poorest citizens in our communities... [who] live in the worst housing, and are the most affected by traffic pollution, live closest to landfill sites and have the worst graffiti and litter problems" Tony Blair, February 2003



"Social justice demands that we act. Locally, poor environmental quality leads to spirals of degradation, promotes fear of crime and exacerbates the decline of neighbourhoods. Good quality environments support regeneration and attract investment"

Margaret Beckett, October 2003



"Health and well-being are influenced by many factors including past and present individual behaviour, health care provision and wider determinants, including social, cultural and environmental factors"

Wanless Report, February 2004



Environmental & Social Justice



Taking it on

"Everyone should share in the benefits of increased prosperity and a clean and safe environment"

Slide 1:

- thank you for inviting us here today
- you will know my colleagues and the Agency's resident air quality experts - Colin Powlesland and Jim Storey
- my role, cross cutting issues eg sustainable communities and transport
- deprivation is new area of policy for the Agency
- the Agency required to take account of social issues in the way we carry out our statutory duties and provide advice to government on the environment
- issue of deprivation and inequality which are currently topping the government's bill raise a lot of questions for our work - particularly on air quality
- Helen Chalmers also sitting in audience

Slide 2:

- inequality is a big political driver. The Government is committed to narrowing the gap between the deprived neighbourhoods and the rest of the country to a level whereby within 10 to 20 years, no one should seriously be disadvantaged by where they live.
- we tend to think that being deprived is about your level of income, whether people have a job or the state of people's health, but is also about the environment.
- growing recognition across government that poorest people live in the worst environments
- Tony Blair speech on sustainable development last year raised this issue and highlighted the importance of raising standards of our local environments in improving deprived areas
- Margaret Beckett echoed this and highlighted how environmental damage can contribute to the spiral of decline in poor neighbourhoods, and how better environments can support regeneration and attract investment - stating that "social justice demands that we act".

Slide 3:

- In 1998, the Acheson report outlined the wider environmental determinants of health, which, Derek Wanless echoed in his recent report on how we tackle the growing inequalities in health and improve the health of the population as a whole.
- a boy in Manchester can still expect to live seven years less than a boy in Barnet. A girl in Manchester can still expect to live six years less than a girl in Kensington Chelsea and Westminster.

Slide 4:

- now wider recognition across government of the need to address environmental and social justice if we are going to promote sustainable development
- that is why environmental and social justice is going to be a core theme of the next UK Sustainable Development Strategy - launched yesterday.
- in case you haven't seen it, the consultation paper raised two issues for environmental and social justice, the importance of:
 - Decent places, and
 - Fairer choices
- these goals raise a number of challenges, which were the starting point for the Agency's work investigation into environmental equality

What is environmental equality?

- Distribution of environmental impacts
- Access to environmental resources
- Ability to influence decisions affecting the environment
- Justice to the environment

Environmental inequalities

Fuel poverty is estimated to affect 4.5 million households in the UK (DETR, 2001), and is linked to higher levels of winter mortality - an average of over 30,000 extra winter deaths per year as a result (National Statistics, 2000)



Public parks assessment suggests that good parks in prosperous areas are getting better, while poor parks in deprived areas are getting much worse.

Over a 12-month period, 1.4 million people miss, turn down or choose not to seek medical help because of transport problems (SQU, 2003)



Slide 5:

- the distribution of environmental impacts on people's health, safety and quality of life
- how people access the environmental 'goods' and resources, such as warmth, good housing, and green space
- people's ability to influence the decisions affecting their local and global environment, how they understand, participate and are engaged in decision-making, and finally
- protecting the intrinsic quality of the environment - such as biodiversity, coastal waters and improved and protected soils
- In other countries, such as the US, the environmental justice debate is well developed. Civil rights groups and communities protested against what they saw as racial discrimination in the siting of polluting factories
- In the UK, environmental justice has developed against a desire to join up environmental and social policy, amongst a background of growing evidence that the poorest people live in the worst environments.

Slide 6:

- This agenda is very broad, for example: Fuel poverty and lack of access to green space are two issues which have been linked to deprivation and have been addressed by government policy in recent years.
- considerable work has also been done by the Social Exclusion Unit to look at the issues of mobility and access to transport services for socially excluded groups.
- Although their recent publication on *Tackling Social Exclusion: Taking stock and looking to the future*, and its notable failure to mention transport issues highlighted the continuing lack of joined up thinking on this issue.

Slide 7:

- Air quality has also been linked to deprivation.
- Studies by campaign groups such as Friends of the Earth in 2001 highlighted proximity of factories to deprived areas.
- There are well known studies linking traffic levels to incidences of poor health and respiratory problems in urban areas
- But we also know that it is not those who are exposed to the impacts of traffic that drive the cars and cause the pollution.
- Which raises an important question about the 'pollution pays principle', when inequalities in the impacts of poor local environments are caused by others and are deemed unfair.

Slide 8:

- We also know from repeated public opinion surveys that air quality issues usually top the bill on people's concerns for their quality of life, after health, crime and jobs.
- And that it is not just the affluent middle classes who consider the quality of their local environment to be important
- In fact, when asked about specific environmental issues, 78% of residents in social class DE think that air quality is 'very important' in comparison to 71% of those in social class AB.

Air quality

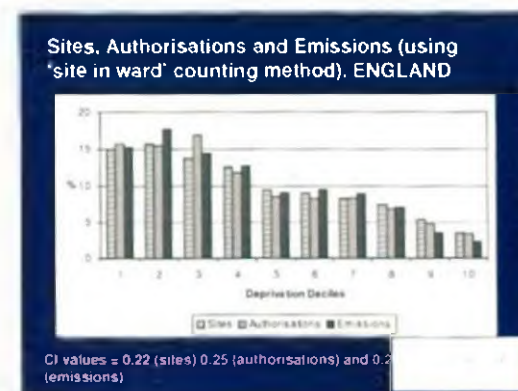
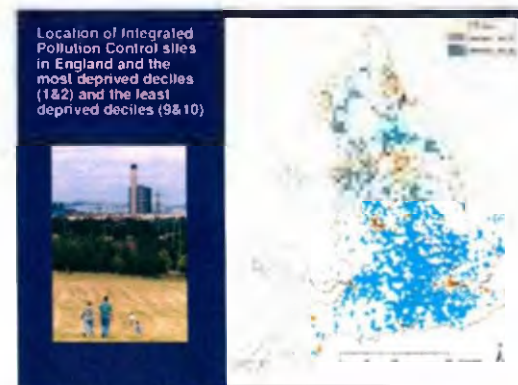
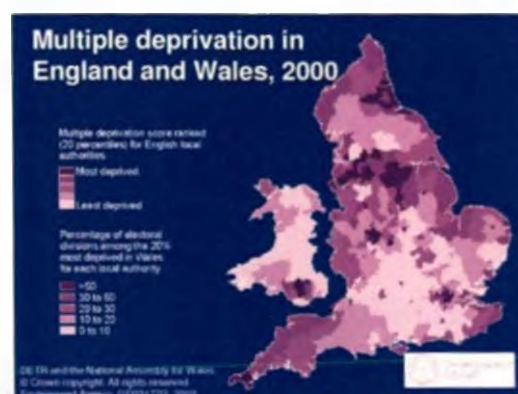


Of 11,400 tonnes of carcinogenic chemicals emitted to air from large factories in England in 1999, 82% were from factories located in the most deprived 20% of local authority wards (FoE, 2001)

Respiratory problems in London have been found to concentrate in the poorest areas and correlate with high traffic levels (Slevenson et al. 1998)

Children in the poorest wards who are exposed to the highest levels of air pollution, are least able to move away from poor air quality and live in areas of low car ownership (Mitchell & Orling, 2001)





Slide 9:

- We know from our work in improving and protecting the environment across the board that the environment matters to people from all different backgrounds
- We think everyone deserves the right to a better quality of life and a clean and safe environment
- That is why Environment Agency takes Environmental Equality seriously.
- That's why we have committed ourselves to 'shifting the focus of our contribution to where we can make the greatest difference, especially in low quality and degraded environments, and [by] ensuring that we include the interests of disadvantaged communities and minority groups in our work'
- and why we were keen to understand the relationship between environmental quality and social deprivation better
- So we brought together a group of researchers, policy-makers and practitioners to identify what the key issues were for environmental equality and how we could do further research in this area.
- choose to look at 3 issues: flooding, IPC sites and air quality
- In our review of the literature on environmental justice, we found that air quality has received the most attention to date.
- Air quality studies have looked at a variety of pollutants at different geographical scales, but have drawn no definite conclusions on the relationship between deprivation and pollution.

Slide 10:

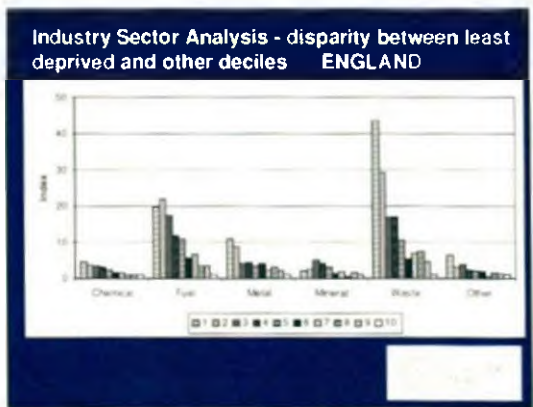
- used the Government's Index of Multiple Deprivation - the most widely used official data set on deprivation, which describes multiple deprivation using 6 domains: income, employment, health and disability, education, skills and training, housing and access to services.
- At present, there is no index for the physical environment. But in its review of the Index last year, the ODPM proposed an indicator on air quality, which the Agency welcomed.
- census ward level
- when I present the results relating to air quality, I will refer to deciles 1 and 2, which contain the 20% most deprived people of the population, and deciles 9 and 10 - the 20% least deprived.

Slide 11:

- We found a strong correlation between the location of industrial sites regulated under the Integrated Pollution Control regime and multiple deprivation.
- There are only 92 sites and 656 emission sources in the 20% least deprived wards (deciles 9 and 10), compared to 316 sites and 3782 emission sources in the 20% most deprived wards (deciles 1 and 2).
- There are 5 times as many sites and authorisations located in the wards containing the most deprived 10% of the population
- and 7 times as many emission sources than in wards with the least deprived 10%.
- The opposite is true for Wales, where there are approximately a 10th of the number of IPC sites than in England, and there is no clear relationship with deprivation.

Slide 12:

- There are 5 times as many sites and authorisations located in the wards containing the most deprived 10% of the population and 7 times as many emission sources than in wards with the least deprived 10%
- The opposite is true in Wales, where there are a 10th of the number of IPC sites and there is no relationship with deprivation.
- We also looked at who lived within 1km of more than 1 site and found that there are about 160,000 people in the most deprived decile living near to 2 or more sites, and only 13,000 in the least deprived decile.
- This relationship becomes more acute when the number of sites within 1km rises.
- Remember again, this is location - not exposure.



Slide 13:

- Looking across the sectors regulated under the IPC regime, we found - perhaps unsurprisingly to some that of all the sectors, the waste sector shows the most acute bias towards the more deprived 10% of the population.
- The proportion of the most deprived decile of the population living within 1km of an IPC waste site is 43 times higher than in the least deprived decile of the population.
- of all IPC sectors, waste is probably where there are the strongest perceptions of risk amongst local communities
- although epidemiological studies that have informed government policy have been unable to find convincing evidence of any adverse health effects of, for example landfill sites
- But as you will have noticed, in this study we were only able to examine the proximity to such sites and not the actual risk or level of exposure.



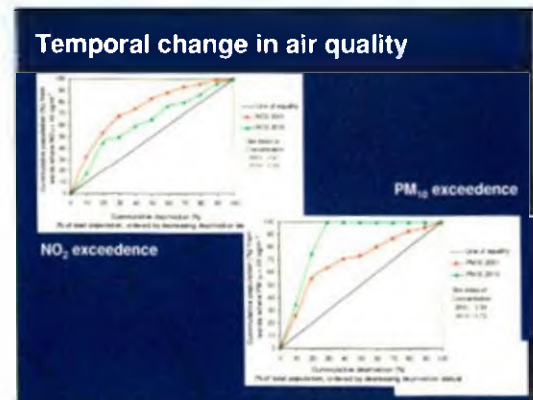
Slide 14:

- Looking at air quality overall, we found that in England both the poorest & most affluent experience worse than average air quality.
- In England, the poor experience the *worst* air quality, bearing a highly disproportionate burden of peak concentrations and exceedences.
- In Wales the picture is very different, wards with highest pollutant concentrations tend to be affluent, but then air quality there is very much better, so poor air quality is less of a deterrent to living in the city.



Slide 15:

- When we examined the characteristics of the populations exposed to the highest ward concentrations (most are within the NAQS standards), we found that of the 10% of the population resident in wards with the poorest air quality, typically half live in wards that are the 20% most deprived in the country.
- We looked at the five major pollutants which form the basis of the National Air Quality Strategy
- people in the more deprived wards are exposed to 41% higher concentrations of NO₂ than those people living in wards of average deprivation.
- We also identified areas where there are particularly high levels of poor air quality and deprivation in England, which many of you probably know personally:
 - MAJOR: (> 5 wards) London (102), Liverpool (10), Manchester (30), Nottingham (11), Sheffield (8).
 - MINOR (1-5 wards) : Bristol, Derby, Thurrock, Leeds, Leicester, Luton, Tyneside, W. Midlands, Huddersfield



Slide 16:

- looking at the likely change in air quality and deprivation in wards where air quality is poorest, from 2001-2010, we found that
- The introduction of tighter air quality standards may lead to an increase in exceedences, which will still be in the more deprived areas.
- Note that unlike NO₂, the distribution of peak values for particulate matter (PM10s) becomes more inequitable.
- the consultants also noted that the designation of Air Quality Management Areas is not represented in the NETCEN data, which was the basis for this analysis. AQMA's are intended to eliminate standard exceedences, particularly in urban areas, which should make the distribution of pollution more equitable. But there is a danger that AQMA's could cause pollution to be redistributed, possibly to more deprived areas.

What questions does this raise?

- How good is the evidence?
- What are the causes of these inequalities?
- What is the cumulative impact of poor air quality?
- When do inequalities become unfair?
- How do we tackle poverty-pollution hotspots in deprived - and non deprived areas fairly?
- What are the most effective ways of tackling these issues?

Our emerging thoughts

- Better assessment of the risk to deprived areas
- Better understanding of the cumulative impacts
- Working more effectively with deprived communities

Opportunities

- UK Air Quality Strategy
- Joining up air quality and deprivation across government
- EU strategy - air quality and vulnerable groups
- Local AQM - AQMSs and Action Plans
- Transport and development planning



ENVIRONMENT AGENCY

NSCA Spring Workshop 2004

Air Quality Management - planning, health & climate change

Abingdon 22-23 April 2004

Slide 17:

- Whilst this was by far the most substantial study undertaken to-date, this research is only a starting point in the development of understanding of environmental inequalities, and raises a number of questions.
- Working at a national level, this analysis may hide regional variations and is limited by the available data. For example, the IPC analysis shows only evidence of inequalities in relation to *proximity* to IPC sites.
- What we don't know yet is the *relative exposure* to hazard or level of risk and what this means for people's health in deprived areas.
- There is also a need to examine the effects of cumulative environmental and social impacts on vulnerable communities and look at other environmental issues such as waste.
- There are multiple social, economic and political processes which affect the historical and likely future distribution of environmental risks such as air quality - all of which need to be better understood.
- at what point do these inequalities become unfair? Should we care about the fact that poor people tend to live in the worst environments, or do we need to apportion blame or discrimination, as they have done in the US before we take action?
- How do tackle poor air quality in areas of deprivation, whilst being fair and consistent across the country?
- and what are the most effective ways of tackling these inequalities?

Slide 18:

- Since we completed this research, we have discussed it with a number of groups - today being part of that process, to see how we as an organisation and others can more effectively manage air quality in deprived areas, and address environmental inequalities in the round.
- Our emerging thinking has led us to think about:
 - how we can better assess the risk of developments and air quality to the human health and quality of life
 - we will need a better understanding of the interactions between air quality, health and other social and economic factors in order to better inform planning and decision-making from a national to a local level. Which will require much better joint working between organisations like the Agency, local authorities and health professionals.
 - how we can work better with deprived communities through processes like Local Strategic Partnerships

Slide 19:

- But this will also require broader action, including the forthcoming National Air Quality Strategy provides a great opportunity to get to grips with how we tackle areas of poor air quality and high social deprivation.
- But this integration also needs to happen across the board. Transport and air quality needs to be an issue across Government.
- The draft European Union Strategy on Environment and Health is focusing on vulnerable groups - children. But this also provides an opportunity to look at other vulnerable groups - particularly the poorest and most deprived people in our communities.
- Air Quality Management Strategies and Action Plans provide mechanisms for tackling failing areas and deciding the most effective ways of working in deprived areas. The DfT's proposed Integrated plans for transport and air quality also provide an opportunity for integration and a more strategic overview of the issues.
- But we must be careful that where 'excellent' authorities choose to opt out of producing AQM plans, that poor air quality is not simply displaced to other areas.
- continue to make sure that air quality is considered across local development, transport and other plans, such as Community Strategies.

Slide 20:

This is just the start this process in thinking about air quality and social deprivation. How would you put the environment and deprivation at the heart of air quality management?

ANNEX 9: Paper to the Policy Steering Group, 8 July 2004

FOR POLICY STEERING GROUP USE ONLY

25/06/04 - ITEM: 4.0

PAPER SPONSORED BY: HEAD OF ENVIRONMENTAL POLICY

TITLE: ADDRESSING ENVIRONMENTAL INEQUALITIES

RECOMMENDATION

The Policy Steering Group (PSG) is asked to:

1. **Agree** on how the Agency should position itself in this policy area (paragraph 3)
2. **Agree** the contribution that we should make to addressing environmental inequalities (paragraph 5)
3. **Comment on and approve** the draft position statement on 'Addressing Environmental Inequalities' as a basis for our future research, advocacy and own role in this area (Annex 1)

1.0 INTRODUCTION

- 1.1 Environmental inequalities is becoming an increasingly important issue across Government. In December 2002 PSG reviewed the Agency's research in this area and asked for more work to be done to develop the Agency's position. This paper and the attached position statement reflect this work. Both are informed by dialogue with a broad range of players from within and outside government.

2.0 WHY SHOULD THE AGENCY SEEK TO INFLUENCE THE ENVIRONMENTAL EQUALITY AGENDA?

- 2.1 In the UK, the issue of environmental justice is rapidly rising up the policy agenda. In its new UK Sustainable Development Strategy, to be launched in 2005, the government is proposing that environment and social justice (and tackling environmental inequalities) is a key theme⁶². The Agency should capitalise on this opportunity to influence government policy because:

- making the links between environmental inequalities and social justice provides us with better leverage on others delivering environmental outcomes;
- tackling environmental inequalities will support our work in tackling environmental degradation in the most deprived areas of England and Wales;
- tackling environmental and social inequalities together is fundamental to delivering sustainable development.

3.0 HOW SHOULD WE POSITION OUR ROLE IN THIS DEBATE?

- 3.1 We have already helped to develop the evidence base around environmental inequalities, and have provided considerable leadership in championing this

⁶² Defra (2004) 'Taking it On: developing UK Sustainable Development Strategy together.

issue across government, where we have already seen a shift in thinking about the environmental dimensions of disadvantage. In future, we should continue to champion and shape the developing policy agenda in this area, but we must also start to balance this with taking what action we can to address environmental inequalities through our own work.

4.0 WHAT SHOULD BE OUR APPROACH IN INFLUENCING OTHERS?

4.1 Our understanding (across government) of many of the issues around environmental inequalities remains sketchy. Therefore, much of our influencing role must focus on the need for further, joint research into the issues and the most effective policy responses at a national, regional and local level.

Over the next year, we should focus our attention on three parts of government:

- (i) **Defra** : Working closely with Defra, who are championing environmental and social justice, will be critical to:
 - ensuring that greater environmental equality is integrated across government policy and wider delivery of sustainable development. One of the ways we will help do this is by holding a high-level policy seminar on this theme with Defra and the NRU in September 2004 to identify priorities for the UK SD Strategy and Government.
 - developing the instruments which will enable the Government and Agency to better tackle and prevent environmental inequalities, particularly where our role is limited, for example in managing the effects of transport on air quality in disadvantaged areas.
 - maximising our contribution where we can, for example, by working with Defra on the new pan-government strategy: 'Making Space for Water' and agreeing how deprivation criteria might best be used to inform and shape strategic prioritisation and resource allocation for both fluvial and coastal flood risk management.
- (ii) **the Office of the Deputy Prime Minister (ODPM)**, and in particular the Neighbourhood Renewal Unit (NRU), which is primarily responsible for tackling disadvantage. We need to understand and influence:
 - the basket of measures that the NRU uses to tackle multiple deprivation; the opportunities for tackling environmental inequalities through these measures; and how we can support these;
 - the power and leverage that the NRU can exert to bend mainstream spend and wider government policy on tackling disadvantage towards greater emphasis on tackling environmental inequalities;
 - how the NRU's research agenda on environmental inequalities can best be co-developed.

We may also need to work with other parts of ODPM, such as the Sustainable Communities Delivery Unit to maximise the opportunities for integrating the environment into policies and programmes for regenerating deprived communities.

(iii) National Assembly for Wales

In Wales, where some of the issues are very different, we will work with the NAW to look at how environmental inequalities can be addressed in Wales, particularly through their Communities First programme and work on regeneration and social inclusion.

In the longer term, we need to build closer links with the Treasury, whose hold of the purse strings and public service delivery targets will be important if this is going to be valued by other departments. We may also want to influence the Department of Health (DoH) and the Home Office, where environmental justice and the environmental determinants of health inequalities are beginning to be recognised, but still need to better reflect the Agency's concerns⁶³, as well as the Department of Transport (DoT).

WHAT ACTION SHOULD THE AGENCY TAKE?

We can demonstrate our contribution to tackling environmental inequalities by:

- (i) developing the evidence base with others to understand environmental inequalities and the most effective ways of tackling them (eg with new research on flood risk, waste, and case studies in local areas);
- (ii) continuing to improve and protect the environment for everyone, but focusing our efforts where we can most benefit the environment and disadvantaged communities by working in partnerships with others (eg in promoting fishing and recreational opportunities);
- (iii) ensuring that our compliance and enforcement processes continue to work fairly to reduce environmental risks in all communities through our approach to modern regulation;
- (iv) working with government and other stakeholders to develop better assessments of risk to inform and shape strategic prioritisation and resource allocation for flood risk management;
- (v) continuing to social-proof our own policies;
- (vi) working more effectively with disadvantaged communities, through decision-making processes, in providing effective information; and in developing mechanisms to promote environmental justice.

⁶³ Environmental justice' is one of the core values of the Home Office 'Building Civil Renewal' (2003) strategy; the DoH's 'Tackling Health Inequalities: A Programme for Action' (2003) recognises the need to tackle the environmental determinants of health inequalities.

PSG is asked to:

- **Agree** on how the Agency should position itself in this policy area (paragraph 3)
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PETER MADDEN

Head of Environmental Policy

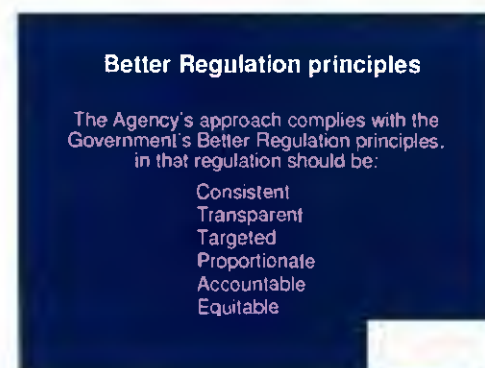
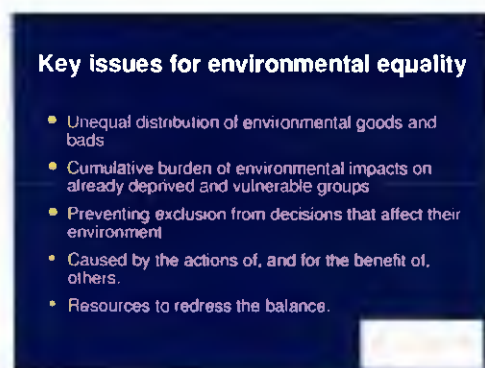
HELEN CHALMERS

Policy Development Officer, Social Policy

16 August 2004

Annex 1 The Agency's Position on Addressing Environmental Inequalities

ANNEX 10: Regulating for the Environment and Social Justice. Presentation by Andrew Skinner, Director of Environmental Protection the cross-government working group on Environment & Social Justice, 20 September 2004



Slide 2:

Often, those most affected by such problems **have not been involved in the decisions that affect the quality of their environment**. What is more, environmental problems can also **limit the opportunities available for people to improve their lives and undermine attempts to renew local neighbourhoods**.

The causes of these inequalities are often complex and long-standing. Some problems are due to the historical location of industry and communities; others are the result of the impacts of new developments such as traffic. **Often these environmental problems are caused by the actions of others who do not live in the affected community** and, once again, where those most affected have not been involved in the decisions that affect the quality of their environment.

Tackling environmental inequalities of the past, preventing people being disproportionately disadvantaged by environmental problems, and ensuring that they have access to a good quality environment in the future, are critical for delivering sustainable development.

Slide 3:

Protecting the environment and human health e.g. through regulating industrial processes. We also provide information and advice about the environmental impacts of developments to inform local and regional planning decisions that affect their location. Where our regulatory framework allows us, we take into account the social and economic impacts of our work, and advise government on the environmental aspects of disadvantage. **Improving the environment and people's access to it** We promote opportunities for fishing and the recreational use of waterways, to help people, including disadvantaged groups, actively enjoy the environment. **Contributing to sustainable development by taking into account social and economic considerations where we can** We work in partnership with others to promote sustainable development, focusing our efforts where we can most benefit the environment, and by including the interests of disadvantaged communities in our work. We also work to encourage participation of deprived and excluded communities in decisions that affect their environment. **Working in partnership e.g. at a local level in deprived communities**

Slide 4:

Better regulation principles - The Environment Agency's approach complies with the Government's Better Regulation principles, that regulation should be:

Consistent

We must apply the same approach within and between sectors and over time.

Transparent

We must have rules and processes which are clear to those in businesses and local communities.

Targeted (or outcome-focused)

The environmental outcome must be central to our planning and in assessing our performance.

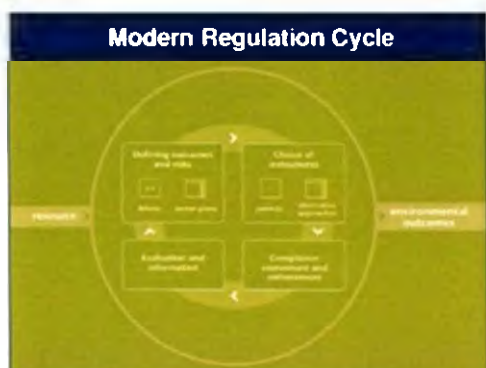
Proportionate (or risk-based)

We must allocate resources according to the risks involved and the scale of outcomes which can be achieved.

Accountable

We must explain ourselves and our performance.

Should we add a further principle? Equitable



Desired outcomes

- Legislation and Policy to promote equity
- Assessments of environmental, social and economic needs
- Proportionate standards to reflect differential impacts and risks
- Best practice
- Compliance leads to continuous improvement

Choosing the Correct Instruments

Based on proper assessment of levels of environmental risk:

- Permits
- Environmental taxes
- Negotiated or voluntary agreements
- Partnership actions

Slide 5:

Modern Regulation cycle

When we talk about Modern Regulation in the Environment Agency, we believe in an approach that comprises of four steps:

- Defining the desired outcomes
- Choosing the correct instruments
- Concentrating on compliance and enforcement
- Evaluating and informing our approach

Slide 6:

Legislation and policy: should reflect the need to promote environmental equity: minimises environmental impacts, promotes sustainable alternatives and prevents the disproportionate environmental impacts in deprived communities. This has to be translated into targets and spending which will provide the legitimacy for change.

Assessments: Assessment of environmental, social and economic pressures and needs to help us design more effective approaches, e.g. use of Social Flood Vulnerability Index in designing Catchment Abstraction Management Strategies. When consulting on new IPPC authorisations, we ask Primary Care Trusts for information on local health sensitivities, and whether they warrant different regulatory decisions or what constitutes BAT. We need to investigate whether taking into account multiple deprivation, and the cumulative, synergistic and long-term impacts of other social and environmental risks could strengthen these processes, and how risk assessment can become more transparent and participatory.

Proportionate standards: We already adopt minimum standards for environmental quality (e.g. air quality), however exceedences often occur in the most deprived areas. If we are taking a proportionate approach to regulation, then environmental standards that are designed to protect public health need to reflect the differential exposure, risks and impacts on different social groups, particularly the most vulnerable, such as children. Proportionate standards need to be based on an assessment of risk that takes into account human vulnerable receptors, just as we do with sensitive environmental receptors e.g. of habitats and waters.

Best practice: e.g. learning from experience of others in Europe, US.

Slide 7:

This assessment and the level of environmental risk ultimately determines the choice of instruments used to protect the environment and human health:

- **Permits** can provide standardised improvement across sectors, or bespoke permits can be flexible and respond to local and site-specific issues, including social justice concepts.
- **Environmental taxes** that provide incentives for good environmental practice e.g. amongst industry (e.g. Landfill tax) or non-regulated Agency impacts (e.g. transport or SMEs), and can be used as compensatory or mitigation measures by funding environmental improvements (e.g. Landfill Tax Credit Scheme) in deprived communities with degraded environments. But need to be careful that these don't disperse environmental impacts elsewhere (e.g. flytipping) and disproportionately affect low-income groups.
- **Negotiated or voluntary agreements** with business can be used to agree enhancements above a legislative minimum, and could be used to negotiate consideration of, and work with local communities (e.g. promoted through Corporate Social Responsibility and, in Scotland, through Good Neighbourhood Agreements), but are often not appropriate for higher risk activities.

Compliance and Enforcement

- OPRA - concentrates our efforts (and in future our resources) where risks are greatest
- Monitoring - could be better developed to involve and empower local communities
- Enforcement - should be proportionate to the risks posed (including risks that are aggregated or inequitable)

Slide 8:

Compliance assessment is used to assess whether objectives have been met, and can involve site visits, audits, scrutiny of reports, check monitoring or responding to incidents and complaints

OPRA We concentrate our efforts where risks are greatest, on the greatest hazards and the poorest performing operators, using tools such as Operator Pollution Risk Appraisal to allocate our resources. We already consider the proximity of the local population, schools and hospitals, but could also extend this appraisal to consider other factors e.g. the differential exposure or health impacts on different social groups and their ability to cope (e.g. access to health services).

Monitoring by the operator and the regulator provides a valuable indication of operator performance, but could be developed to better involve and empower local communities (e.g. through the use of lay science in water quality monitoring, or as used in the US to monitor air quality).

Enforcement: Enforcement should be proportionate to the risks posed to the environment and the seriousness of the violation, but could also take into account risks that are aggregated, disproportionate or inequitable. Penalties and fines that reflect the risks to communities and their environment, and the need to deter pollution in areas of multiple deprivation.

Slide 9:

Evaluate and inform

Evaluation will need to reflect our policy aims – whether that is reducing environmental injustice, reducing the gap or improving the poorest areas. This needs to be reflected across government targets, spending and guidance for regulators, local authorities or business.

Information on environmental performance is made publicly available, and is being constantly improved through tools such as the Agency's Pollution Inventory, Spotlight, What's in your backyard etc. **We need better corporate reporting from business to build trust with communities** on the issues that matter to them. And to do this we will need ...

Measurement: better measurement and information on the social and environmental risks to different communities, which can be used to inform local planning and regulatory processes.

Feedback into new legislation which should be subject to Regulatory Impact Assessment, **which considers the costs and benefits and implications on equity and fairness.**

Slide 10:

What is needed to ensure regulation contributes to environment and social justice

Government **commitment and leadership on environment and social justice** to provide the legitimacy and tools for others to act.

Concerted action to develop **appropriate policy and regulatory instruments, such as equity assessments** to ensure that government policy does not contribute to environmental inequalities but helps address them.

Learn from experience on the ground, and from other countries in Europe and the US.

But first of all, **decide on the outcomes** you seek in bringing about greater environment and social justice.

- reduce or prevent environmental injustice
- reduce inequalities and the relative difference between people and places bring about greater equality of

Evaluate and Inform

- **Evaluation** - must reflect our policy aims
- **Informing** - building trust by making environmental performance information publicly available
- **Measurement** - to include environmental and social impacts on different communities and public access to data
- **Feedback** - into new legislation

What is needed?

- Commitment and leadership
- Appropriate policy and regulatory instruments
- Appropriate resources
- Learning from experience
- Decisions on desired outcomes
 - reduce or prevent environmental injustice
 - reduce inequalities and relative differences between people and places
 - bring about greater equality of outcome

ANNEX 11: Environment Agency response to UK Strategy for Sustainable Development commitments for addressing environmental inequalities, 7 March 2005

Sir John Harman, Chairman, Environment Agency: 'Tackling Environmental Inequalities'.

There is much to welcome in the new Strategy. I want to focus on one area, where we have been doing lots of work: the links between social disadvantage and poor environmental quality.

The evidence is worrying:

- Poorer people are twice as likely to live near polluting factories.
- People in the 10% most deprived areas in England suffer the worst air quality.
- Children from families on low incomes are five times more likely to be killed by road traffic than children from affluent areas.

If you visit some of the deprived neighbourhoods I have seen, you will understand how poor environmental quality can be a barrier to neighbourhood renewal. These neighbourhoods are more likely to suffer from poorer health, worse air quality, higher levels of environmental crime and ugly public spaces.

This is not an easy issue to tackle. There are complex interactions at play. But we are glad that Government is making a start.

The Strategy should lead to greater **understanding** of the problem. We welcome the commitment to more funding for research into the causes of environmental inequality - and the effectiveness of measures to tackle it. This year, the Environment Agency is undertaking research to understand the social impacts of flooding, waste and water quality, and their distribution on deprived and vulnerable communities. We are also planning to undertake

two local case studies to understand how best to address cumulative environmental impacts.

Government then needs to **involve** the people concerned in defining the solutions – and publishing information on what they can expect in terms of a decent and healthy environment and strengthening the contribution of Local Strategic Partnerships to sustainable development will help.

Then people will want to see **action**. We welcome the proposals for encouraging all local service providers - through local authorities and LSPs - to focus action on improving the poorest quality environments. But this will require clear baselines, targets and measures.

Finally, Government and its partners will need to **measure** progress. The proposed new indicators of social justice and environmental equality should help to do this.

In many ways, the quality of the environment in our country is improving. Regulation from government, investment by business and commitment from groups and individuals has given us cleaner air, rivers and beaches. However, there are still too many areas where the environment is substandard.

We need to create neighbourhoods that are decent places to live. These are more likely to attract business, improve employment opportunities and help break the cycle of deprivation.

We look forward to working with Defra and others to – as the Strategy says – 'ensure these things happen'.

